ServerView Resource Orchestrator Cloud Edition V3.0.0

Operation Guide

Windows/Linux

Preface

Purpose

This manual provides an outline of ServerView Resource Orchestrator (hereinafter Resource Orchestrator) and the operations and settings required for setup.

Target Readers

This manual is written for system administrators who will use Resource Orchestrator to operate the infrastructure in private cloud or data center environments.
When setting up systems, it is assumed that readers have the basic knowledge required to configure the servers, storage, network devices, and server virtualization software to be installed. Additionally, a basic understanding of directory services such as Active Directory and LDAP is necessary.

Organization

This manual is composed as follows:

Title	Description
Section 1 Overview of Operation, Maintenance, and Monitoring	
Chapter 1 Overview	Provides an overview of operation, maintenance, and monitoring of Resource Orchestrator.
Section 2 Operation by Infrastructure Administrators	
Chapter 2 Managing User Accounts	Explains the management of user accounts.
Chapter 3 Managing Tenants	Explains the management of tenants.
Chapter 4 Managing Templates	Explains the management of templates.
Chapter 5 Managing Resources and Resource Pools	Explains the management of resources and resource pools.
Chapter 6 Modifying Configurations	Explains how to modify various setting information.
Section 3 Maintenance by Infrastructure Administrators	
Chapter 7 Hardware Maintenance	Explains the maintenance of hardware.
Chapter 8 Backup and Restoration of Admin Servers	Explains how to back up and restore the admin server when using Basic mode.
Section 4 Monitoring by Infrastructure Administrators	
Chapter 9 Monitoring Resource Pools (Dashboard)	Explains the monitoring of resource pools.
Chapter 10 Monitoring Resources	Explains the monitoring of resources.
Chapter 11 Monitoring L-Platforms	Explains the monitoring of L-Platforms.
Chapter 12 Metering	Explains metering.
Chapter 13 Monitoring Logs	Explains the monitoring of logs.
Section 5 High Availability	
Chapter 14 Failover	Explains failover.
Chapter 15 Disaster Recovery	Explains the Disaster Recovery function for L-Servers.
Appendix A Notes on Operating ServerView Resource Orchestrator	Gives important reminders for the operation of Resource Orchestrator.
Appendix B Access Control by Roles	Explains the control of access using roles.

Title	Description
Appendix C User Management Using Directory Service	Explains the management of users when using a directory service.
Glossary	Explains the terms used in this manual. Please refer to it when necessary.

Notational Conventions

The notation in this manual conforms to the following conventions.

- When using Resource Orchestrator and the functions necessary differ due to the necessary basic software (OS), it is indicated as follows:

[Windows]	Sections related to Windows (When not using Hyper-V)
[Linux]	Sections related to Linux
[VMware]	Sections related to VMware
[Hyper-V]	Sections related to Hyper-V
[Xen]	Sections related to RHEL5-Xen
[Oracle VM]	Sections related to Oracle VM
[Windows/Hyper-V]	Sections related to Windows and Hyper-V
[Windows/Linux]	Sections related to Windows and Linux
[Linux/VMware]	Sections related to Linux and VMware
[VM host]	Sections related to Windows Server 2008 with VMware or Hyper-V enabled

- Unless specified otherwise, the blade servers mentioned in this manual refer to PRIMERGY BX servers.

- References and character strings or values requiring emphasis are indicated using double quotes (").

- Window names, dialog names, menu names, and tab names are shown enclosed by brackets ([ ]).

- Button names are shown enclosed by angle brackets (< >) or square brackets ([ ]).

- The order of selecting menus is indicated using [ ]-[ ].

- Text to be entered by the user is indicated using bold text.

- Variables are indicated using italic text and underscores.

- The ellipses ("...") in menu names, indicating settings and operation window startup, are not shown.

- The ">" used in Windows is included in usage examples. When using Linux, read ">" as meaning "#".

Menus in the ROR console

Operations on the ROR console can be performed using either the menu bar or pop-up menus.
By convention, procedures described in this manual only refer to pop-up menus.

Documentation Road Map

The following manuals are provided with Resource Orchestrator. Please refer to them when necessary:

Manual Name	Abbreviated Form	Purpose
ServerView Resource Orchestrator Cloud Edition V3.0.0 Setup Guide	Setup Guide CE	**Please read this first.** Read this when you want information about the purposes and uses of basic functions, and how to install Resource Orchestrator.
ServerView Resource Orchestrator Cloud Edition V3.0.0 Installation Guide	Installation Guide CE	Read this when you want information about how to install Resource Orchestrator.
ServerView Resource Orchestrator Cloud Edition V3.0.0 Operation Guide	Operation Guide CE	Read this when you want information about how to operate systems that you have configured.
ServerView Resource Orchestrator Cloud Edition V3.0.0 User's Guide for Infrastructure Administrators (Resource Management)	User's Guide for Infrastructure Administrators (Resource Management) CE	Read this when you want information about how to operate the GUI (resource management) used by infrastructure administrators and dual-role administrators.
ServerView Resource Orchestrator Cloud Edition V3.0.0 User's Guide for Infrastructure Administrators	User's Guide for Infrastructure Administrators CE	Read this when you want information about how to operate the GUI (for operations other than resource management) used by infrastructure administrators and dual-role administrators.
ServerView Resource Orchestrator Cloud Edition V3.0.0 User's Guide for Tenant Administrators	User's Guide for Tenant Administrators CE	Read this when you want information about how to operate the GUI used by tenant administrators.
ServerView Resource Orchestrator Cloud Edition V3.0.0 User's Guide for Tenant Users	User's Guide for Tenant Users CE	Read this when you want information about how to operate the GUI used by tenant users.
ServerView Resource Orchestrator Cloud Edition V3.0.0 Reference Guide for Infrastructure Administrators (Resource Management)	Reference Guide (Resource Management) CE	Read this when you want information about commands used by infrastructure administrators and dual-role administrators to manage resources, messages output by the system, and how to perform troubleshooting.
ServerView Resource Orchestrator Cloud Edition V3.0.0 Reference Guide for Infrastructure Administrators	Reference Guide CE	Read this when you want information about the commands used by infrastructure administrators and dual-role administrators for operations other than resource management.
ServerView Resource Orchestrator Cloud Edition V3.0.0 Messages	Messages CE	Read this when you want detailed information about the corrective actions for displayed messages.

In some cases this manual may ask you to refer to the following Virtual Edition manuals.
Please refer to them when necessary:

Manual Name	Abbreviated Form	Purpose
ServerView Resource Orchestrator Virtual Edition V3.0.0 Setup Guide	Setup Guide VE	Read this when you want information about the purposes and uses of basic functions, and how to install Resource Orchestrator.
ServerView Resource Orchestrator Virtual Edition V3.0.0 Installation Guide	Installation Guide VE	Read this when you want information about how to install Resource Orchestrator.
ServerView Resource Orchestrator Virtual Edition V3.0.0 Operation Guide	Operation Guide VE	Read this when you want information about how to operate systems that you have configured.
ServerView Resource Orchestrator Virtual Edition V3.0.0 User's Guide	User's Guide VE	Read this when you want information about how to operate the GUI.

Manual Name	Abbreviated Form	Purpose
ServerView Resource Orchestrator Virtual Edition V3.0.0 Command Reference	Command Reference	Read this when you want information about how to use commands.
ServerView Resource Orchestrator Virtual Edition V3.0.0 Messages	Messages VE	Read this when you want detailed information about the corrective actions for displayed messages.

Related Documentation

Please refer to these manuals when necessary.

- When using NetApp storage

    - Data ONTAP Storage Management Guide

- When using ETERNUS storage

    - ETERNUS SF Storage Cruiser User's Guide

    - ETERNUS SF Storage Cruiser Message Guide

    - ETERNUS SF Express V15.0/ AdvancedCopy Manager Operation Guide for Copy Control Module

- When using EMC storage

    EMC Navisphere Manager Administrator's Guide

Abbreviations

The following abbreviations are used in this manual:

Abbreviation	Products
Windows	Microsoft(R) Windows Server(R) 2008 Standard Microsoft(R) Windows Server(R) 2008 Enterprise Microsoft(R) Windows Server(R) 2008 R2 Standard Microsoft(R) Windows Server(R) 2008 R2 Enterprise Microsoft(R) Windows Server(R) 2008 R2 Datacenter Microsoft(R) Windows Server(R) 2003 R2, Standard Edition Microsoft(R) Windows Server(R) 2003 R2, Enterprise Edition Microsoft(R) Windows Server(R) 2003 R2, Standard x64 Edition Microsoft(R) Windows Server(R) 2003 R2, Enterprise x64 Edition Windows(R) 7 Professional Windows(R) 7 Ultimate Windows Vista(R) Business Windows Vista(R) Enterprise Windows Vista(R) Ultimate Microsoft(R) Windows(R) XP Professional operating system
Windows Server 2008	Microsoft(R) Windows Server(R) 2008 Standard Microsoft(R) Windows Server(R) 2008 Enterprise Microsoft(R) Windows Server(R) 2008 R2 Standard Microsoft(R) Windows Server(R) 2008 R2 Enterprise Microsoft(R) Windows Server(R) 2008 R2 Datacenter
Windows 2008 x86 Edition	Microsoft(R) Windows Server(R) 2008 Standard (x86) Microsoft(R) Windows Server(R) 2008 Enterprise (x86)
Windows 2008 x64 Edition	Microsoft(R) Windows Server(R) 2008 Standard (x64) Microsoft(R) Windows Server(R) 2008 Enterprise (x64)
Windows Server 2003	Microsoft(R) Windows Server(R) 2003 R2, Standard Edition Microsoft(R) Windows Server(R) 2003 R2, Enterprise Edition

Abbreviation	Products
	Microsoft(R) Windows Server(R) 2003 R2, Standard x64 Edition Microsoft(R) Windows Server(R) 2003 R2, Enterprise x64 Edition
Windows 2003 x64 Edition	Microsoft(R) Windows Server(R) 2003 R2, Standard x64 Edition Microsoft(R) Windows Server(R) 2003 R2, Enterprise x64 Edition
Windows 7	Windows(R) 7 Professional Windows(R) 7 Ultimate
Windows Vista	Windows Vista(R) Business Windows Vista(R) Enterprise Windows Vista(R) Ultimate
Windows XP	Microsoft(R) Windows(R) XP Professional operating system
Linux	Red Hat(R) Enterprise Linux(R) 5 (for x86) Red Hat(R) Enterprise Linux(R) 5 (for Intel64) Red Hat(R) Enterprise Linux(R) 5.1 (for x86) Red Hat(R) Enterprise Linux(R) 5.1 (for Intel64) Red Hat(R) Enterprise Linux(R) 5.2 (for x86) Red Hat(R) Enterprise Linux(R) 5.2 (for Intel64) Red Hat(R) Enterprise Linux(R) 5.3 (for x86) Red Hat(R) Enterprise Linux(R) 5.3 (for Intel64) Red Hat(R) Enterprise Linux(R) 5.4 (for x86) Red Hat(R) Enterprise Linux(R) 5.4 (for Intel64) Red Hat(R) Enterprise Linux(R) 5.5 (for x86) Red Hat(R) Enterprise Linux(R) 5.5 (for Intel64) Red Hat(R) Enterprise Linux(R) 5.6 (for x86) Red Hat(R) Enterprise Linux(R) 5.6 (for Intel64) Red Hat(R) Enterprise Linux(R) 5.7 (for x86) Red Hat(R) Enterprise Linux(R) 5.7 (for Intel64) Red Hat(R) Enterprise Linux(R) 6.2 (for x86) Red Hat(R) Enterprise Linux(R) 6.2 (for Intel64) SUSE(R) Linux Enterprise Server 11 for x86 SUSE(R) Linux Enterprise Server 11 for EM64T
Red Hat Enterprise Linux	Red Hat(R) Enterprise Linux(R) 5 (for x86) Red Hat(R) Enterprise Linux(R) 5 (for Intel64) Red Hat(R) Enterprise Linux(R) 5.1 (for x86) Red Hat(R) Enterprise Linux(R) 5.1 (for Intel64) Red Hat(R) Enterprise Linux(R) 5.2 (for x86) Red Hat(R) Enterprise Linux(R) 5.2 (for Intel64) Red Hat(R) Enterprise Linux(R) 5.3 (for x86) Red Hat(R) Enterprise Linux(R) 5.3 (for Intel64) Red Hat(R) Enterprise Linux(R) 5.4 (for x86) Red Hat(R) Enterprise Linux(R) 5.4 (for Intel64) Red Hat(R) Enterprise Linux(R) 5.5 (for x86) Red Hat(R) Enterprise Linux(R) 5.5 (for Intel64) Red Hat(R) Enterprise Linux(R) 5.6 (for x86) Red Hat(R) Enterprise Linux(R) 5.6 (for Intel64) Red Hat(R) Enterprise Linux(R) 5.7 (for x86) Red Hat(R) Enterprise Linux(R) 5.7 (for Intel64) Red Hat(R) Enterprise Linux(R) 6.2 (for x86) Red Hat(R) Enterprise Linux(R) 6.2 (for Intel64)
Red Hat Enterprise Linux 5	Red Hat(R) Enterprise Linux(R) 5 (for x86) Red Hat(R) Enterprise Linux(R) 5 (for Intel64) Red Hat(R) Enterprise Linux(R) 5.1 (for x86) Red Hat(R) Enterprise Linux(R) 5.1 (for Intel64) Red Hat(R) Enterprise Linux(R) 5.2 (for x86)

Abbreviation	Products
	Red Hat(R) Enterprise Linux(R) 5.2 (for Intel64) Red Hat(R) Enterprise Linux(R) 5.3 (for x86) Red Hat(R) Enterprise Linux(R) 5.3 (for Intel64) Red Hat(R) Enterprise Linux(R) 5.4 (for x86) Red Hat(R) Enterprise Linux(R) 5.4 (for Intel64) Red Hat(R) Enterprise Linux(R) 5.5 (for x86) Red Hat(R) Enterprise Linux(R) 5.5 (for Intel64) Red Hat(R) Enterprise Linux(R) 5.6 (for x86) Red Hat(R) Enterprise Linux(R) 5.6 (for Intel64) Red Hat(R) Enterprise Linux(R) 5.7 (for x86) Red Hat(R) Enterprise Linux(R) 5.7 (for Intel64)
Red Hat Enterprise Linux 6	Red Hat(R) Enterprise Linux(R) 6.2 (for x86) Red Hat(R) Enterprise Linux(R) 6.2 (for Intel64)
RHEL5-Xen	Red Hat(R) Enterprise Linux(R) 5.4 (for x86) Linux Virtual Machine Function Red Hat(R) Enterprise Linux(R) 5.4 (for Intel64) Linux Virtual Machine Function
RHEL-KVM	Red Hat(R) Enterprise Linux(R) 6.2 (for x86) Virtual Machine Function Red Hat(R) Enterprise Linux(R) 6.2 (for Intel64) Virtual Machine Function
SUSE Linux Enterprise Server	SUSE(R) Linux Enterprise Server 11 for x86 SUSE(R) Linux Enterprise Server 11 for EM64T
DOS	Microsoft(R) MS-DOS(R) operating system, DR DOS(R)
Oracle VM	Oracle VM Server for x86
ESC	ETERNUS SF Storage Cruiser
GLS	PRIMECLUSTER GLS
Navisphere	EMC Navisphere Manager
Solutions Enabler	EMC Solutions Enabler
MSFC	Microsoft Failover Cluster
SCVMM	System Center Virtual Machine Manager 2008 R2 System Center 2012 Virtual Machine Manager
VMware	VMware vSphere(R) 4 VMware vSphere(R) 4.1 VMware vSphere(R) 5
VMware FT	VMware Fault Tolerance
VMware DRS	VMware Distributed Resource Scheduler
VMware DPM	VMware Distributed Power Management
VMware vDS	VMware vNetwork Distributed Switch
VIOM	ServerView Virtual-IO Manager
ServerView Agent	ServerView SNMP Agents for MS Windows (32bit-64bit) ServerView Agents Linux ServerView Agents VMware for VMware ESX Server
ROR VE	ServerView Resource Orchestrator Virtual Edition
ROR CE	ServerView Resource Orchestrator Cloud Edition
Resource Coordinator	Systemwalker Resource Coordinator Systemwalker Resource Coordinator Virtual server Edition

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Contents

Part 1   Overview of Operations, Maintenance, and Monitoring

Chapter 1 Overview

This chapter provides an overview of operation, maintenance, and monitoring of Resource Orchestrator.

For additional information on the operation, maintenance, and monitoring of this product, refer to the configuration information in the "Setup Guide CE".

1.1 Operation, Maintenance and Monitoring by Infrastructure Administrators

This section explains operation, maintenance, and monitoring by infrastructure administrators when using Resource Orchestrator.

The operations that infrastructure administrators (infra_admin) can perform are as follow:

- Management of resources and resource pools

    - Registration, modification, and deletion of resources

    - Creation, deletion, modification of global pools and tenant local pools

    - Confirmation of approval and application status for L-Platform usage applications

- Management of tenants

    - Creation, modification, and deletion of tenants

    - Create a tenant administrator

    - Creation, modification, and deletion of user accounts

- Management of templates

    - Creation, modification, and deletion of L-Platform templates

    - Creation, modification, and deletion of L-Server templates

Maintenance operations that infrastructure administrators (infra_admin) can perform are as follow:

- Hardware maintenance

- System maintenance (*1)

- Backup and restoration of admin servers (*1)

*1: OS administrative privileges are necessary for OS maintenance and backup and restore of admin servers.

Monitoring operations that infrastructure administrators (infra_admin) can perform are as follow:

- Monitoring of resource pools using dashboard

- Monitoring of L-Platform operation statuses

- Monitoring of resource capacity (servers, storage and network)

- Monitoring of operation logs and audit logs

1.2 Operation, Maintenance and Monitoring by Tenant Administrators

For details on operations, maintenance and monitoring by tenant administrators, refer to the "User's Guide for Tenant Administrators CE".

1.3 Operation, Maintenance and Monitoring by Tenant Users

For details on operations, maintenance and monitoring by tenant users, refer to the "User's Guide for Tenant Users CE".

Part 2   Operation by Infrastructure Administrators

Chapter 2 Managing User Accounts

This section explains the management of user accounts.

Use the [Account] tab in the ROR console to operate user accounts.

For details on the [Account] tab, refer to "Chapter 9 Account" of the "User's Guide for Infrastructure Administrators CE".

Chapter 3 Managing Tenants

This section explains the management of tenants.

The following are possible for tenant management:

- Create tenants

- Create and delete tenants

3.1 Creating Tenants

The flow of tenant creation is as follows:

1. Register tenants

   Input the tenant information and register tenants.

2. Create a tenant administrator

   Select the tenant from the created users.

3. Create a local pool for tenants

   The following two types of resource pool operations can be performed:

   - Local Pool

     A resource pool which can be used only for tenants.
     A resource stored in a local pool cannot be used by a user of another tenant.

   - Global Pool

     A common resource pool which can be used by the entire system.

   For details on how to select resource pools, refer to "3.2 Tenant and Resource Pool Design" of the "Setup Guide CE". When using a local pool, create a local pool used only by the tenant registered in step 1.

4. Register resources

   Register the resources created in 3.in the local pool.

For details, refer to "8.3 Creating a Tenant" of the "User's Guide for Infrastructure Administrators CE".

3.2 Modifying Tenants

Use the [Tenant] tab in the ROR console for the following operations.

For details on the [Tenant] tab, refer to "Chapter 8 Tenant" of the "User's Guide for Infrastructure Administrators CE".

- Register tenants

- Create a tenant administrator

- Create a tenant resource pool

- Create and delete tenants

3.3 Deleting Tenants

Use the [Tenant] tab in the ROR console for the following operations.

For details on the [Tenant] tab, refer to "Chapter 8 Tenant" of the "User's Guide for Infrastructure Administrators CE".

- Register tenants

- Create a tenant administrator

- Create a tenant resource pool

- Create and delete tenants

Chapter 4 Template Management

This chapter explains the management of templates.

- L-Platform Templates

An L-Platform template is the template to define the logical configuration of ICT resources and software.
An L-Platform is composed of an L-Platform template.
Use the [Template] tab to create, modify, and delete L-Platform templates.
For details on the [Template] tab, refer to "Chapter 5 Template" of the "User's Guide for Infrastructure Administrators CE".

- L-Server Templates

An L-Server template is the template defining the specifications of an L-Server (number of CPUs, memory capacity, disk capacity, and number of NICs) used for an L-Platform.
For details on the L-Server template format, refer to "2.2 L-Server Templates" of the "Reference Guide (Resource Management) CE".
For details on L-Server template operations, refer to "Chapter 8 L-Server Template Operations" of the "User's Guide for Infrastructure Administrators (Resource Management) CE".

Chapter 5 Managing Resources and Resource Pools

This chapter explains the management of resources and resource pools.

5.1 Managing Resource Pools

This section explains the management of resource pools.

The following resource pool operations are possible:

- Addition and modification of tenants and local pools

- Deletion of local pools within tenants

- Addition, modification, and deletion of global pools

When changing the global pool that can be used by tenants, perform the operation from the [Tenant] tab on the ROR console.

For details on the [Tenant] tab, refer to "Chapter 8 Tenant" of the "User's Guide for Infrastructure Administrators CE".

5.2 Managing Resources

This section explains the management of resources.

Use the [Resource] tab in the ROR console to register, change, or delete resources.

- Register resources

  Refer to "Chapter 2 Register Resources" in the "User's Guide for Infrastructure Administrators (Resource Management) CE".

- Changing Resources

  Refer to "Chapter 3 Changing Resources" in the "User's Guide for Infrastructure Administrators (Resource Management) CE".

- Delete Resources

  Refer to "Chapter 5 Delete Resources" of the "User's Guide for Infrastructure Administrators (Resource Management) CE".

5.2.1 Adding Network Devices

This section explains the operation for adding network devices.

5.2.1.1 Adding L2 Switches to Handle Insufficient Numbers of Ports when Adding Servers

This section explains the procedure for addition, assuming a case where it is necessary to add L2 switches, since the LAN ports of the L2 switch to connect to are insufficient when adding servers.

The explanation is mainly about operations related to L2 switches.

When there is no description, the following operations are performed by an infrastructure administrator.

Figure 5.1 Image of L2 Switches to Add
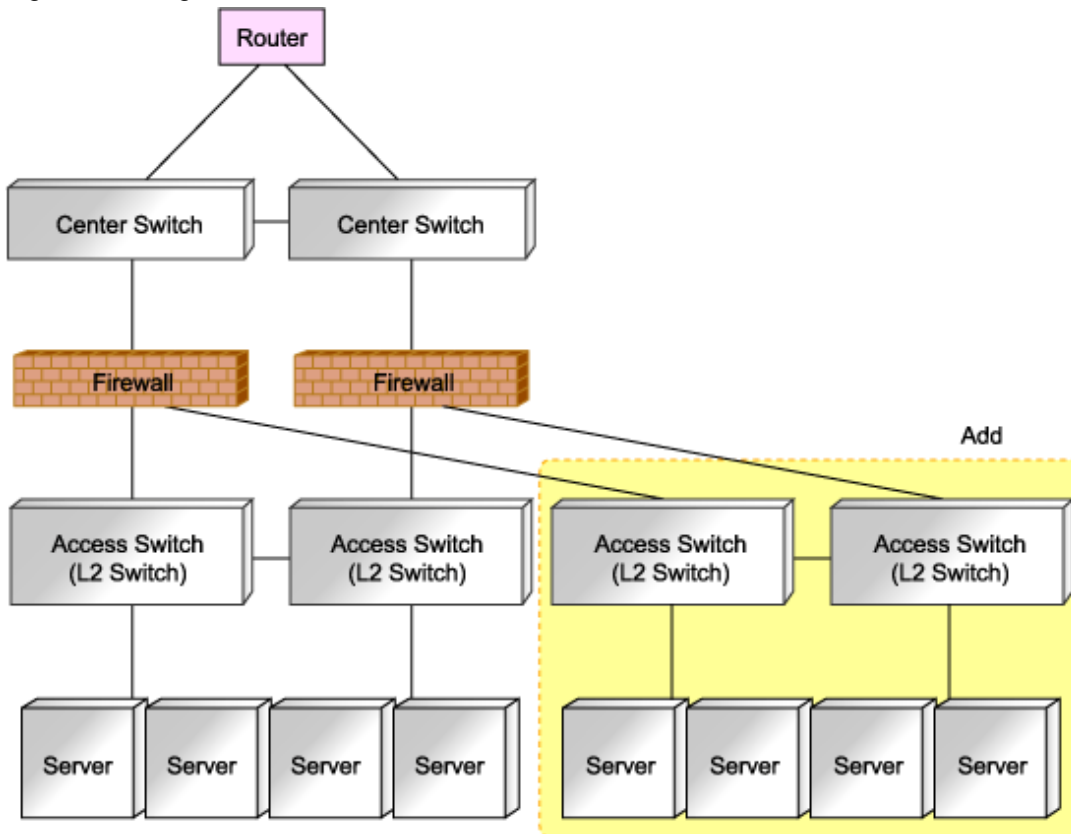
1. Design additional configurations. (Network device administrator)

2. Provide the additional network device information to the infrastructure administrator. (Network device administrator)

   Add a network device in the state where the following operations have been completed.

   - Initial configuration

   - Operation test

   - Integration of the device into a physical network configuration

3. Register the resources of the server.

   It is necessary to register chassis or LAN switch blades for a blade server.

4. Create network configuration information (XML definition) using the acquired network device information.

5. Register an additional L2 switch as a network device.

   Use the rcxadm netdevice create command to register as a network device.

6. When the following applies to the additional network device, create and register rulesets.

   - When adding an L2 switch of a model for which sample scripts are not prepared, or an L2 switch of a model that has not been used in the system until now.

     In this case, it is necessary to create a directory to allocate rulesets to.

   - When using a model for which sample scripts are not prepared, or even when using a model which has been used in the system until now, by configuring definitions using the different rules (scripts)

   - Even when using a model for which sample scripts are prepared, and when using a model with definitions configured using different rules (scripts)

> 📋 **Note**
>
> ....
>
> Details of sample scripts may be reviewed and modified. When using rulesets modified from prepared sample scripts, the modified details will be cleared by replacing the modified scripts with the sample scripts, when updating sample scripts.
> In order to prevent this type of problem, when creating scripts by referring to sample scripts, create the new rulesets after copying the rulesets of the sample script, and perform necessary modifications.
>
> ....

7. Change all resources using the additional network devices.

   It is necessary to add the information about uplink ports of the added chassis, when adding a blade server.

   Use the rcxadm network modify command to modify a network resource.

8. Register the added server as a resource in the necessary resource pool.

> 📚 **See**
>
> ....
>
> - For details on the initial configurations of network devices, refer to "4.2.2.3 Settings for Managed Network Devices" of the "Setup Guide CE".
>
> - For details on how to create network configuration information (XML definition), refer to "2.6 Network Configuration Information" of the "Reference Guide (Resource Management) CE".
>
> - For details on the rcxadm netdevice command, refer to "1.3.6 rcxadm netdevice" in the "Reference Guide (Resource Management) CE".
>
> - For details on the ruleset creation and the registration destinations, refer to "6.2.1 Creating a Folder for Registering Rulesets" of the "Setup Guide CE".
>
> - For details on the rcxadm network command, refer to "1.3.5 rcxadm network" of the "Reference Guide (Resource Management) CE".
>
> - For details on how to register a resource in a resource pool, refer to "12.3 Resource Operations" of the "User's Guide for Infrastructure Administrators (Resource Management) CE".
>
> ....

5.2.1.2 Adding Firewalls and L2 Switches for Additional Tenants

This section explains the procedure for addition, assuming a case where it is necessary to add a network device or a server in order to add a tenant.

The explanation is mainly about operations related to firewalls and L2 switches.

When there is no description, the following operations are performed by an infrastructure administrator.

Figure 5.2 Image of Tenants to Add
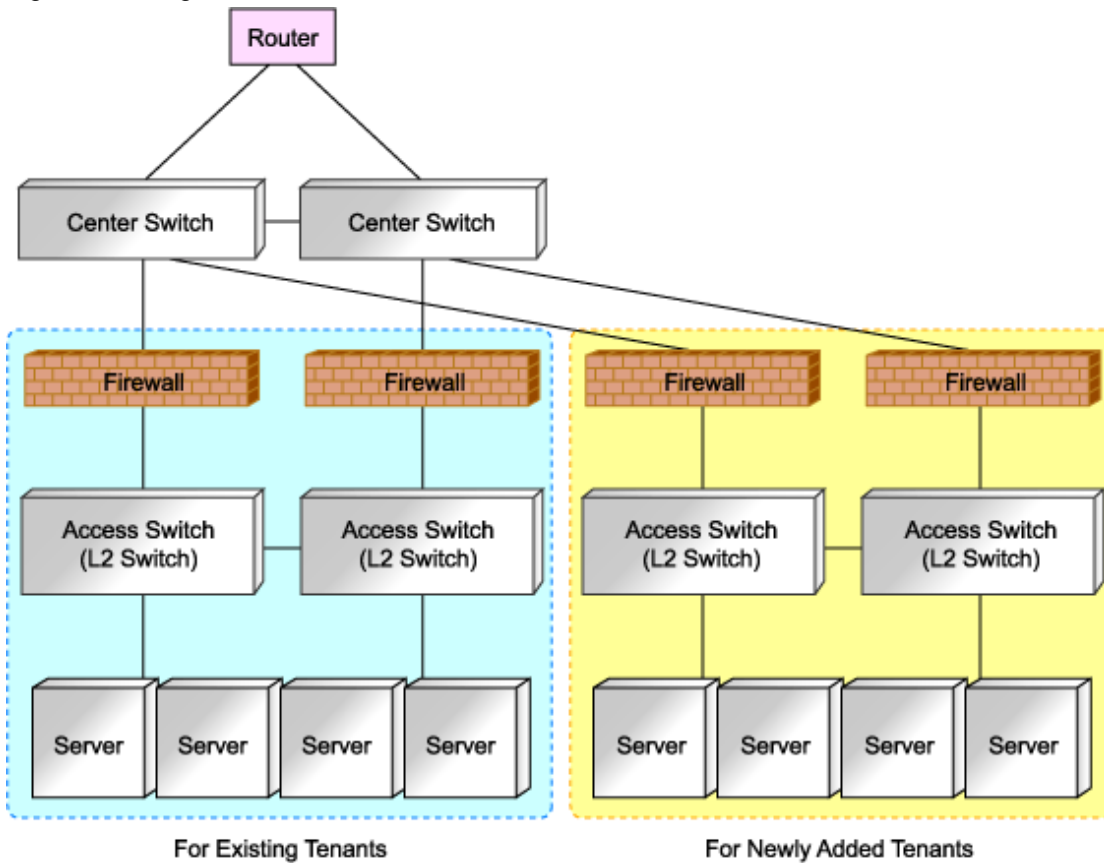
1. Design additional configurations. (Network device administrator)

2. Provide the additional network device information to the infrastructure administrator. (Network device administrator)

   Add a network device in the state where the following operations have been completed.

   - Initial configuration

   - Operation test

   - Integration of the device into a physical network configuration

3. Register the resources of the server.

   It is necessary to register chassis or LAN switch blades for a blade server.

4. Create network configuration information (XML definition) using the acquired network device information.

5. Register an additional firewall and L2 switch as network devices.

   Use the rcxadm netdevice create command to register as a network device.

6. When the following applies to the additional network device, create and register rulesets.

   - When adding a firewall or an L2 switch of a model for which sample scripts are not prepared or a firewall or an L2 switch of a model which has not been used in the system until now.

     In this case, it is necessary to create a directory to allocate rulesets to.

   - When using a model for which sample scripts are not prepared, or even when using a model which has been used in the system until now, by configuring definitions using the different rules (scripts)

   - Even when using a model for which sample scripts are prepared, and when using a model with definitions configured using different rules (scripts)

Note

Details of sample scripts may be reviewed and modified. When using rulesets modified from prepared sample scripts, the modified details will be cleared by replacing the modified scripts with the sample scripts, when updating sample scripts.

In order to prevent this type of problem, when creating scripts by referring to sample scripts, create the new rulesets after copying the rulesets of the sample script, and perform necessary modifications.

7. Create a tenant and register a tenant administrator.

8. Back up environments using the functions provided by the firewall.

   The backup can be used for restoration, when replacing firewall devices due to failure.

   For details on how to back up environments, refer to the manual of the firewall.

9. Register an additional server and firewall in a resource pool for tenant as resources.

See

- For details on the initial configurations of network devices, refer to "4.2.2.3 Settings for Managed Network Devices" of the "Setup Guide CE".

- For details on how to create network configuration information (XML definition), refer to "2.6 Network Configuration Information" of the "Reference Guide (Resource Management) CE".

- For details on the rcxadm netdevice command, refer to "1.3.6 rcxadm netdevice" in the "Reference Guide (Resource Management) CE".

- For details on the ruleset creation and the registration destinations, refer to "6.2.1 Creating a Folder for Registering Rulesets" of the "Setup Guide CE".

- For details on how to create a tenant, refer to "13.3 Tenants" of the "User's Guide for Infrastructure Administrators (Resource Management) CE".

- For details on how to register a tenant administrator, refer to "Chapter 9 Operating User Accounts" of the "User's Guide for Infrastructure Administrators (Resource Management) CE".

- For details on how to register a resource in a resource pool, refer to "12.3 Resource Operations" of the "User's Guide for Infrastructure Administrators (Resource Management) CE".

5.2.2 Adding or Modifying Connection Destinations of Network Devices

This section explains the procedure for adding or modifying destinations for network device connection.

When there is no description, the following operations are performed by an infrastructure administrator.

1. Notify your infrastructure administrator about the addition or modification of the destination for network device connection. (Network device administrator)

2. Create network configuration information (XML definition) using the acquired network device information.

3. Confirm there are no differences besides the link information (under Links tag) regarding the added or modified destinations for connection, by comparing the network configuration information of network devices registered in Resource Orchestrator and the network configuration information created in 2.

   If there is any difference, check with the system administrator that network device configurations have not been modified, and change the network configuration information if necessary.

   The network configuration information of network devices registered in Resource Orchestrator can be obtained using the rcxadm netconfig export command.

4. Modify the network device by setting the confirmed network configuration information as the input information.

   Use the rcxadm netdevice modify command to modify network devices.

5. Confirm from the ROR console that the network device information has changed, and the status is normal.

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- For details on how to create network configuration information (XML definition), refer to "2.6 Network Configuration Information" of the "Reference Guide (Resource Management) CE".

- For details on the rcxadm netconfig command, refer to "1.3.7 rcxadm netconfig" in the "Reference Guide (Resource Management) CE".

- For details on the rcxadm netdevice command, refer to "1.3.6 rcxadm netdevice" in the "Reference Guide (Resource Management) CE".
....

5.3 Reviewing Resource Usage

This section explains how to review resource usage.

Review for L-Platform Usage Applications

Use the [Request] tab of the ROR console to review applications to use from tenant users for operations such as usage application, configuration modification, and cancel of L-Platforms.
For details on the [Request] tab, refer to "Chapter 7 Request" of the "User's Guide for Infrastructure Administrators CE".

5.3.1 Administration of L-Platform

This section explains how to perform L-Platform operations.

5.3.1.1 Deleting Unnecessary Data

If a L-Platform or server deployed by this product was accidently deleted by virtualization software such as VMware, it is possible to delete unneeded information about the system or server remaining in this product.

What is actually done is that the unneeded L-Platform information or server information status is changed to "Finished with return" with the Delete unneeded data (cfmg_deletesysdata) command so that it is no longer displayed in the L-Platform management View.

Refer to "5.4 cfmg_deletesysdata (Unnecessary Data Deletion)" in the *Reference Guide CE* for details on this command.

5.3.1.2 Updating the Cloning Image

In this product, the resource ID is used when managing the cloning image.

If the cloning image has been updated, the resource ID will be changed, so the image information must be updated in order to return the resource ID back to its previous setting.

If the cloning image has been updated, use an operation from the "Template" window to update the image information.

Refer to "5.3.8 Synchronizing Image Information" in the *User's Guide for Infrastructure Administratorsfor* details.

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To use both cloning masters (the cloning master before the update and the cloning master after the update) in the L-Platform template, updating a single cloning master will not work. Instead, these cloning masters must be collected separately.
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5.3.1.3 Importing L-Servers

The Import L-Server command (cfmg_importlserver) can be used to import servers that have been deployed, or the VM guests that have been imported using the ROR Console, to the L-Platform Management function.

Refer to "5.3 cfmg_importlserver (Import L-Server)" in the *Reference Guide CE* for details on this command.

5.3.1.4 Setting OS with Deployment on RHEL-KVM

Windows OS

When the virtualization software is RHEL-KVM, the following OS configuration procedure is necessary on each deployed server with Windows OS to enable the settings of the IP addresses, the default gateway, and the host name.

The infrastructure administrator must look up the IP addresses and the host name in the L-Platform management window and the default gateway in the resource management window, and then connect a console to the deployed server and configure the OS manually.

Users cannot access the server until this configuration is completed.

The administrator should include a description like "The IP address needs to be set by the administrator after deployment" in the description field of the L-Platform template, and notify users that the server has become accessible after the configuration.

Linux OS with SELinux enabled

The administrator must disable SELinux when creating an image, and should include a description like "SELinux needs to be enabled after the deployment has been completed" in the description field of the L-Platform template.

Because Linux OS is deployed with SELinux disabled, users must enable it after the deployment has been completed.

5.3.1.5 Startup Priority Level Settings

Any server with a startup priority level set to 0 will not startup or shutdown when performing bundled power supply operations.

An information message will be output to **vsys_trace_log** for any server that did not startup or shutdown.

If any server that either did not startup or shutdown actually needs to be started up or shut down, refer to the information message and use the **StartLServer** or **StopLServer** command to startup or shutdown individually.

Refer to "7.3.3.5 StartLServer (Starts a Server)" and "7.3.3.6 StopLServer (Stops a Server)" in the *Reference Guide CE* for details on this command.

5.3.1.6 Action to Take when an Error has Occurred

When an error has occurred during a cancellation application by a tenant user, the cancellation application may become impossible.

In that case, confirm the system ID of the L-Platform, and use the **Disable L-Platform Application** command to make the cancellation application possible again for the user.

For information on the **Disable L-Platform Application** command, refer to "5.5 recoverService (Disable L-Platform Application)" in the *Reference Guide CE*.

5.3.1.7 Setting Activity Monitoring

When using activity monitoring on an L-Platform, it needs to be deployed specifying an L-Server template in which the setting of activity monitoring is enabled.

For information on creating L-Server templates, refer to "8.1.2.1 Creating a Physical L-Server Template" in the *User's Guide for Infrastructure Administrators (Resource Management)*

Additionally, in order to change the setting after the deployment, use the "rcxadm lserver modify" command.

For information on the "rcxadm lserver modify" command, refer to "1.3.1 rcxadm lserver" in the *Reference Guide for Infrastructure Administrators (Resource Management)*

Chapter 6 Changing Settings

This chapter explains how to change settings.

6.1 Registering and Deleting Application Process Assessors

This section explains how to register and delete application process assessors.

6.1.1 Registering an Application Process Assessor

This section explains how to register an infrastructure administrator or dual-role administrator as an application process assessor.

Add all infrastructure administrator and dual-role administrator to the directory service IflowUsers group in order to use application processes. Use the LDIF file to register an application process assessor at the directory server. Follow the procedure below to register as application process assessor.

1. Create an infrastructure administrator or dual-role administrator.

2. Add the infrastructure administrator or dual-role administrator as a member of the IflowUsers group.

Note

- Infrastructure administrators and dual-role administrators who have not been registered in the "IflowUsers" group cannot conduct assessment in application processes. Also, if infrastructure administrators and dual-role administrators not registered in the "IflowUsers" group select the **Request** tab in the ROR Console, the following error message appears:

```
Error message : Failed to authenticate the user.
```

- Administrators (dual-role administrators) created during installation are not registered in the "IflowUsers" group. Add them to the "IflowUsers" group.

- If an email address is not set, assessment request emails are not sent, and reservation notification emails are not sent when an error occurs.

- If no infrastructure administrators or dual-role administrators are registered in the IflowUsers group, the following message is displayed after the application is forwarded from the **Forward screen** window when the user subscribes to the service:

```
PCS1002
An error occurred while processing application.
Please contact the infrastructure administrators.
```

Refer to "Appendix C User Management Using Directory Service" in the *Operation Guide CE* for information on how to register application process assessor.

6.1.2 Deleting an Application Process Assessor

This section explains how to delete an infrastructure administrator or dual-role administrator from the application process assessors.

6.1.2.1 Deleting an infrastructure administrator/dual-role administrator from IflowUsers Group

Follow the procedure below to delete an infrastructure administrator or dual-role administrator from the IflowUsers group members.

For OpenDS

1. Create an LDIF file.

   Edit a sample LDIF file to create the file. An example of an LDIF file is shown below.

```
# Delete manager from IflowUsers
dn: cn=IflowUsers,ou=group,dc=fujitsu,dc=com
changetype: modify
delete: member
member:cn=manager,ou=users,dc=fujitsu,dc=com
```

2. Execute the ldapmodify command.

   [Windows]

   Specify the created LDIF file, and then execute the ldapmodify command.

```
<OpenDS installation directory>\bat\ldapmodify.bat" -p <port number> -f <ldif file> -D
<administrator user DN> -w <password>
```

   An execution example is shown below.

```
c:\> c:\Program Files (x86)\Fujitsu\ServerView Suite\opends\bat\ldapmodify -p 1473 -D
"cn=Directory Manager" -w admin -f c:\ldif\deleteuserfromgroup.ldif
Processing MODIFY request for cn=IflowUsers,ou=group,dc=fujitsu,dc=com
MODIFY operation successful for DN cn=IflowUsers,ou=group,dc=fujitsu,dc=com
```

   [Linux]

   Specify the created LDIF file, and then execute the ldapmodify command.

```
# <OpenDS installation directory>/bin/ldapmodify" -p <port number> -f <ldif file> -D
<administrator user DN> -w <password>
```

   An execution example is shown below.

```
# /opt/fujitsu/ServerViewSuite/opends/bin/ldapmodify -p 1473 -D "cn=Directory Manager" -f /tmp/
ldif/adduser2group.ldif -w admin
Processing MODIFY request for cn=IflowUsers,ou=group,dc=fujitsu,dc=com
MODIFY operation successful for DN cn=IflowUsers,ou=group,dc=fujitsu,dc=com
```

📩 Note

- - In the command input line, enter the command as one line without entering any line feeds.

- - For the directory service port number, administrator DN, and administrator DN password, enter the values that were set during installation.

For Active Directory

1. From the Start menu, open [Control Panel]-[Administrative Tools]-[Active Directory Users and Computers].

2. Select the name of a domain that is managed by Active Directory.

3. Right-click "IflowUsers" of the organizational unit "Group", and select [Property].

4. Select the [Members] tab, and select the members to delete from the member list, and click the [Remove] button.

5. A confirmation dialog will be displayed. Click [Yes].

6. After returning to the property window of the group, confirm that the members have been deleted correctly,

   and click the [OK] button.

6.2 Settings for Sending E-mail

This section explains how to change settings for sending an email.

6.2.1 Settings for the Email Sent from Tenant Management

Email sent from the tenant management will be enabled only if the tenant has set the Performing tenant management setting.
When an operation such as registering a tenant or adding or changing a user has been performed, notification to that effect is sent to the tenant administrators, tenant users, and tenant email addresses within that same tenant.

Refer to "6.4 Settings for Sending E-mail" in the *Setup Guide CE* for information on how to change settings for e-mail sent from tenant administrators.

6.2.2 Settings for Email Sent from the L-Platform Management Window

Email sent from the L-Platform management window notifies the end or failure of processing to the tenant administrators and the tenant users when the tenant users have used the ROR Console to perform an application to use L-Platform, an L-Platform modification, or an application to cancel L-Platform.

Refer to "6.4 Settings for Sending E-mail" in the *Setup Guide CE* for information on how to change settings for e-mail sent from the L-Platform Management window.

6.2.3 Email Sent via an Application Process

An email will be sent via the application process when changes or requests have been made.
The following notification will be sent for an application to use L-Platform, an L-Platform modification, or an application to cancel L-Platform from the L-Platform management window:

- Notification of acceptance of application, rejection of application, and dismissal of application to the tenant users

- Notification of request for approval and dismissal of application to the tenant administrators

- Notification of request for assessment to the infrastructure administrators

Refer to "6.4.5 Settings for Email Sent via the Application Process" in the *Setup Guide CE* for information on how to change settings for email sent from an application process."

6.2.4 Settings for the Email Sent from the Dashboard

Email sent from the Dashboard will be enabled only if using the dashboard alert function.
The dashboard sends notifications to e-mail address setting in Customizing Email Send Settings if the global pool use rate exceeds the threshold value.

Refer to "6.4.6 Settings for Email Sent from the Dashboard" in the *Setup Guide CE* for information on how to set settings for e-mail sent from the dashboard alert function.

6.3 Settings for Port Number of Management Servers

This section explains how to change a management server port number.

6.3.1 ROR Console settings

This section explains how to change the port number of a ROR Console server.

Stopping the manager

Stop the manager.
Refer to "7.2 Starting and Stopping the Manager" in the *Setup Guide CE* for information on how to stop the manager.

Changing the portal.properties file

The procedure for changing the port number is as follows.

1. Modify the port number.

    Open the following file:

```
<Installation directory for this product >\RCXCTMG\SecurityManagement\conf\portal.properties
```

[Linux]

```
/etc/opt/FJSVctsec/conf/portal.properties
```

Change the port numbers of the ROR console server described in the following URL. Set the same values in the port numbers:

- portalSsl.url

- authedPortal.url

- sendmail.auth.url

2. Start the Interstage Management Console.

    The procedure for starting the Interstage Management Console is as follows:

    [Windows]

    From the **Start** menu, select **All Programs** > **Interstage** > **Application Server** > **Interstage Management Console**.

    [Linux]

    1. Start the Web browser.

    2. Specify the URL of the Interstage Management Console.

        The URL format is as follows:
        (If SSL encrypted communication is not being used)

        http://[*Host name*]:[*Port number*]/IsAdmin/

        (If SSL encrypted communication is being used)

        https://[*Host name*]:[*Port number*]/IsAdmin/

    3. Login to the Interstage Management Console.

3. Change the port number.

    Select **System** > Services > Web Server > **RCXCT-ext** > Web Server Settings to change the port number.

Starting the manager

Start the manager.
Refer to "7.2 Starting and Stopping the Manager" in the *Setup Guide CE* for information on how to start the manager.

6.3.2 L-Platform Management Settings

This section explains how to change the port number of L-Platform management.

Stopping the manager

Stop the manager.
Refer to "7.2 Starting and Stopping the Manager" in the *Setup Guide CE* for information on how to stop the manager.

Changing the port number of L-Platform management

The procedure for changing the port number of L-Platform management is as follows:

1. Modify the port number of

    Open the following file:

    [Windows]

```
<Installation directory for this product>\RCXCTMG\SecurityManagement\conf\portal.properties
```

[Linux]

```
/etc/opt/FJSVctsec/conf/portal.properties
```

The following information must be modified:

  - Port number of vsys.host URL

Modify the value of the port number in vsys.host URL. An example is shown below. The section in italics is the information to be modified.

```
vsys.host = http://192.168.11.22:8013/vsys/services/VSYS/
```

2. Modify the value of the entry tag with vsys-port as the key value.

Open the following file.

[Windows]

```
<Installation directory for this product>\RCXCTMG\MyPortal\config\managerview_config.xml
```

[Linux]

```
/etc/opt/FJSVctmyp/config/managerview_config.xml
```

The following information must be modified:

  - Value of the entry tag with vsys-port as the key value

Modify the value of the entry tag with vsys-port as the key value. An example is shown below. The section in italics is the information to be modified.

Starting the manager

Start the manager.
Refer to "7.2 Starting and Stopping the Manager" in the *Setup Guide CE* for information on how to start the manager.

6.3.3 Systemwalker Runbook Automation Web Console Settings

This section explains how to modify the settings of Systemwalker Runbook Automation Web Console.

6.3.3.1 How to Modify the FQDN of the Systemwalker Runbook Automation Web Console

This section explains how to modify the FQDN of the Systemwalker Runbook Automation Web Console.

Stopping the manager

Stop the manager.
Refer to "7.2 Starting and Stopping the Manager" in the *Setup Guide CE* for information on how to stop the manager.

Modify the FQDN of the Systemwalker Runbook Automation Web Console

Follow the steps below to modify the FQDN of the Systemwalker Runbook Automation Web Console:
Open the following file.

[Windows]

```
<Installation directory for this product >\RCXCTMG\MyPortal\config\application_process.properties
```

[Linux]

```
/etc/opt/FJSVctmyp/config/application_process.properties
```

The following information must be modified:

- FQDN in APPLICATION_PROCESS_CONSOLE_URL URL

Modify the value of FQDN in APPLICATION_PROCESS_CONSOLE_URL URL. An example is shown below: It is information that the part of the *Italic* changes.

```
APPLICATION_PROCESS_CONSOLE_URL=http://localhost:80/console/Default
```

Starting the manager

Start the manager.
Refer to "7.2 Starting and Stopping the Manager" in the *Setup Guide CE* for information on how to start the manager.

6.3.3.2 How to Modify the Port Number of the Systemwalker Runbook Automation Web Console

This section explains how to modify the port number of the Systemwalker Runbook Automation Web Console.

Stopping the manager

Stop the manager.
Refer to "7.2 Starting and Stopping the Manager" in the *Setup Guide CE* for information on how to stop the manager.

Modify the port number of the Systemwalker Runbook Automation Web Console

Follow the steps below to modify the port number of the Systemwalker Runbook Automation Web Console:
Open the following file.

[Windows]

```
<Installation directory for this product >\RCXCTMG\MyPortal\config\application_process.properties
```

[Linux]

```
/etc/opt/FJSVctmyp/config/application_process.properties
```

The following information must be modified:

- Port number of APPLICATION_PROCESS_CONSOLE_URL URL

Modify the value of the port number in APPLICATION_PROCESS_CONSOLE_URL URL. An example is shown below. The section in italics is the information to be modified.

```
APPLICATION_PROCESS_CONSOLE_URL=http://localhost:80/console/Default
```

Starting the manager

Start the manager.
Refer to "7.2 Starting and Stopping the Manager" in the *Setup Guide CE* for information on how to start the manager.

6.4 Editing Information in the Home Window

This section explains how to edit the information that is displayed on the lower part of the home window of the ROR Console.

Information are divided into those for infrastructure administrators and those for tenant administrators and tenant users, so use the following respective text files to edit them:

For infrastructure administrators

[Windows]

```
<Installation directory for this product>\RCXCTMG\Operation\conf\home_infra_mes.txt
```

[Linux]

```
/opt/FJSVctope/conf/home_infra_mes.txt
```

For tenant administrators and tenant users

[Windows]

```
<Installation directory for this product>\RCXCTMG\Operation\conf\home_tenant_mes.txt
```

[Linux]

```
/opt/FJSVctope/conf/home_tenant_mes.txt
```

Note

- Nothing will be displayed in the information if the text file does not exist.

- If information has been edited, collect a backup of the text file after the edit.

Settings

Enter the message, line by line, in the following format:

```
date, message
```

- The format of the date is unrestricted

- If date is not required, use a comma (,) at the beginning of the line, and enter the message thereafter.

- Lines starting with a sharp (#) are treated as a comment. Such a line will therefore be ignored.

- UTF-8 must be used as the character code in the text file.

- As the initial value, "YYYY/MM/DD,XXXX" is written in the text file. Edit the file as required to suit your usage.

- There is no problem even if a comma (,) is included in the message. Enter a comma (,) as it is.

Example of settings

```
2011/11/11,Maintenance is scheduled for the Kanto network on the weekend.
#2011/11/10,Admin Server was enabled.
,Upgraded the operation management software.
```

Point

The information can also be used to notify tenant administrators and tenant users of who to contact.

6.5 Settings for L-Platform Management

This section explains how to change the settings for L-Platform management.

6.5.1 Settings for Permissions to Change L-Platform Templates

This section explains how to change settings for whether or not changes to the L-Platform templates in the L-Platform management window are to be permitted.

Stopping the manager

Stop the manager.
Refer to "7.2 Starting and Stopping the Manager" in the *Setup Guide CE* for information on how to stop the manager.

Changing L-Platform templates

The procedure for changing the settings for whether or not changes to the L-Platform templates in the L-Platform management window are to be permitted is as follows:
Open the following file.

[Windows]

```
<Installation directory for this product >\RCXCTMG\MyPortal\config\custom_config.xml
```

[Linux]

```
/etc/opt/FJSVctmyp/config/custom_config.xml
```

The following information must be modified:

- The entry tag with no-configuration as the key value

Modify the value of the entry tag with no-configuration as the key value. The section in italics is the information to be modified. Specify "false" to allow the L-Platform template to be modified. Specify "true" to not allow it to be modified.

```
<entry key="no-configuration">false</entry>
```

Starting the manager

Start the manager.
Refer to "7.2 Starting and Stopping the Manager" in the *Setup Guide CE* for information on how to start the manager.

6.5.2 Subnet Settings at Segment Editing

It is possible to change the method for setting up the subnets that are allocated to segments when performing an application to use L-Platform. Use the following procedure to use network resource names rather than IP addresses to select which subnets to allocate to segments during subnet setup.

Refer to "6.3.11 L-Platform Reconfiguration" in the *User's Guide for Tenant Administrators* for details on changing the configuration.

1. Open the Manager View settings file in a text editor.

   The Manager View settings file is stored in the following location:

   [Windows]

   ```
   <Installation directory for this product >\RCXCTMG\MyPortal\config\managerview_config.xml
   ```

   [Linux]

   ```
   /etc/opt/FJSVctmyp/config/managerview_config.xml
   ```

2. Add the following key and value.

Key name	Content
network-list-show-resource-name	false: Uses the IP address to select a subnet. (This is the default value. This is applicable even when this key is not defined.) true: Uses the network resource name to select a subnet.

3. Save the file.

4. Restart the manager.
   Refer to "7.2 Starting and Stopping the Manager" in the *Setup Guide CE* for information on how to Restart the manager.

6.5.3 Setting the Host Names for Virtual Servers

This product sets the host names (computer names) for the virtual servers that are deployed. These names are automatically generated as below:

```
VXXXXXXXXXXNNNN
XXXXXXXXX: Nine arbitrary alphanumeric characters (part of the L-Platform ID)
NNNN: A four-digit serial number starting from 0001
```

The setting method can be changed to make the correspondence between these host names and actual servers more obvious.

The following setting methods can be selected:

Setting method number	Setting method	Description
1	Automatic generation	This is the original function.
2	Server name	The host name is set to the string that the user specifies as the "server name" in the ROR console.
3	Special string + serial number	The Template Manager specifies a special string, and the host name is set to a string consisting of this special string followed by a serial number.
4	Tenant ID + serial number	The host name is set to a string consisting of the tenant ID for the user followed by a serial number.

6.5.3.1 Setting Method

Use the following procedure to specify the setting method:

1. Open the definition file in a text editor.

   The definition file is stored in the following location:

   [Windows]

   ```
   <Installation directory for this product>\RCXCFMG\config\vsys_config.xml
   ```

   [Linux]

   ```
   /etc/opt/FJSVcfmg/config/vsys_config.xml
   ```

2. Add the following keys and values:

Key name	Setting range	Content
hostname-method	1 to 4	Specify the method for setting host names. If this key is omitted, "1" will be used as the default value. Note: The number specified for this key corresponds to the setting method number in the table.
hostname-header	An arbitrary string with one to eight characters (*)	Specify the particular string to be set as the host name. This key is only valid if "3" is specified for the "hostname-method" key. If this key is omitted, "VM-" will be used as the default value.
hostname-digits	1 to 7	Specify the number of digits for the serial number to be set for the host name. This key is only valid if "3" or "4" is specified for the "hostname-method" key. If this key is omitted, "7" will be used as the default value.
hostname-check	yes/no	This key specifies whether to check for duplicate host names.

Key name	Setting range	Content
		This key is only valid if "2" is specified for the "hostname-method" key. yes: Returns a deployment error if the same host name exists on the server where the system has been deployed. no: Does not return an error even if the same host name exists. If this key is omitted, "yes" will be used as the default value.

*: The characters that can be specified are alphanumeric characters and hyphens ("-"). However, the string cannot consist of only numbers.

A specification example is shown below:

💡 Example
. . . .

```
<properties version="1.0">
    :
  <entry key="hostname-method">3</entry>
  <entry key="hostname-header">HOST-</entry>
  <entry key="hostname-digits">4</entry>
```

. . . .

3. Save the file.

4. Restart the manager.
   Refer to "7.2 Starting and Stopping the Manager" in the *Setup Guide CE* for information on how to Restart the manager.

6.5.3.2 Setting Form

Automatic generation

The following host name will be automatically generated:

```
VXXXXXXXXXNNNN
XXXXXXXXX: Nine arbitrary alphanumeric characters (part of the system ID)
NNNN: A four-digit serial number starting from 0001
```

This behavior is the original (default) behavior.

Server name

This method directly sets the host name to the string that the user has set as the "server name" in the Manager View.

The characters that can be specified for the server name are subject to the following restrictions:

Maximum string length	15 characters
Characters that can be specified	Alphanumeric characters or hyphens ("-"). However, the string cannot consist of only numbers.

A deployment error will occur if a string that does not match these restrictions is specified.

If "yes" has been specified for the "hostname-check" key, a deployment error will occur if you specify a server name that duplicates the name of a server that has already been deployed. (An error will also occur even if the server name duplicates the name of a server belonging to another organization.)

Host names can be set up only when new systems are created.

The host name will not be changed even if the server name is changed by changing the configuration after deployment.

Special string + serial number

This method sets the host name to a string consisting of the string that the Template Manager has specified for the "hostname-header" key in the definition file, followed by a serial number with the number of digits specified by "hostname-digits".

The serial number starts from 1 and is left padded with zeros.

The serial number that will be set for the next server to be deployed can be checked using the command for displaying a list of serial numbers for host name settings (cfmg_listhostnamecounter).

Refer to "5.1 cfmg_listhostnamecounter (Display List of Serial Numbers for Host Name Settings)" in the *Reference Guide* for details on this command.

Example

When "VM-" is specified for "hostname-header" and "7" is specified for "hostname-digits"

```
VM-0000001
```

A deployment error will occur if the serial number overflows.

Serial numbers are unique within the entire Admin Server, but are managed separately for each of the strings specified for "hostname-header".

If the serial number has overflowed, either reset the serial number using the command for resetting the serial number for host name settings (cfmg_resethostnamecounter) or change the value for "hostname-header" to enable systems to be deployed again.

Refer to "5.2 cfmg_resethostnamecounter (Reset List of Serial Numbers for Host Name Settings)" in the *Reference Guide CE* for details

Tenant ID + serial number

This method sets the host name to a string consisting of the tenant ID for the user that made the deployment request, followed by a serial number with the number of digits specified for "hostname-digits".

The serial number starts from 1 and is left padded with zeros.

The serial number that will be set for the next server to be deployed can be checked using the command for displaying a list of serial numbers for host name settings (cfmg_listhostnamecounter).

Refer to "5.1 cfmg_listhostnamecounter (Display List of Serial Numbers for Host Name Settings)" in the *Reference Guide* for details on this command.

Example

When "DIV" is specified for the tenant ID and "7" is specified for "hostname-digits"

```
DIV0000001
```

A deployment error will occur if the serial number overflows.

Serial numbers are managed separately for each organization ID.

If the serial number has overflowed, reset the serial number using the command for resetting the serial number for host name settings (cfmg_resethostnamecounter) to enable systems to be deployed again.

Refer to "5.2 cfmg_resethostnamecounter (Reset List of Serial Numbers for Host Name Settings)" in the *Reference Guide* for details on this command.

6.5.4 Setting the Method for Setting Resource Names

🅿 Point

Setting the method for setting resource names allows the names of virtual servers created using L-PlatformSubscription (L-Server names) to be made to match any of the following. Performing this setting allows servers to be identified easily:

Server ID

Host name

Server name

In this product, the method for setting resource names for the L-Platform to be deployed can be selected from a number of methods.

The target resources are as follows:

- Folder

- L-Server

The following methods for setting resource names can be selected for these resources:

Folder name

Setting method number	String set as the folder name
1	L-Platform ID (the default method)
2	Tenant ID + serial number
3	Tenant name + system name

L-Server name

Setting method number	String set as the L-Server name
1	Server ID (the default method)
2	Host name
3	Server name

6.5.4.1 Setting Method

Use the following procedure to specify the setting method:

1. Open the definition file in a text editor.

The definition file is stored in the following location:

[Windows]

```
<Installation directory for this product >\RCXCFMG\config\vsys_config.xml
```

[Linux]

```
/etc/opt/FJSVcfmg/config/vsys_config.xml
```

1. Add the following keys and values:

Key name	Setting range	Content
folder-name-method	1 to 3	Specify the method for setting folder names. If this key is omitted, "1" will be used as the default value. Note: The numbers correspond to the setting method numbers in the table in "Folder name".
lserver-name-method	1 to 3	Specify the method for setting L-Server names. If this key is omitted, "1" will be used as the default value. Note: The numbers correspond to the setting method numbers in the table in "L-Server name".

A specification example is shown below:

📝 Example
. . . .

```
<properties version="1.0">
    :
  <entry key="folder-name-method">2</entry>
  <entry key="lserver-name-method">2</entry>
```

. . . .

2. Save the file.

3. Restart the manager.
   Refer to "7.2 Starting and Stopping the Manager" in the *Setup Guide CE* for information on how to Restart the manager.

6.5.4.2 Setting Form

Folder name

The L-Platform deployed by ROR Console are in a 1:1 correspondence with folders.

By changing the method for setting folder names, the L-Platform or tenant deployed by ROR Console can be made to correspond to folders more easily.

L-Platform ID

This method sets the L-Platform ID as the name of the folder corresponding to the L-Platform to be deployed.

The L-Platform ID will be a string with 9 digits of random alphanumeric characters added to the first 8 characters of the tenant name.

📝 Example
. . . .

The result will be the following kind of string:

```
sosiki1-WCJFRUH6L
```

. . . .

This setting is the default setting for ROR Console It is recommended that this setting method be used in operational situations where there is no need to have the L-Platform deployed by this product correspond to r folders.

Tenant ID + serial number

This method sets the tenant ID followed by a four-digit serial number as the name of the folder corresponding to the L-Platform to be deployed.

🔰 Example

. . . .

The result will be the following kind of string:

```
sosiki1-0001
```

. . . .

This string is not displayed in the L-Platform management window for ROR Console, and so in order to maintain correspondence between the L-Platform deployed by this product and folders it is necessary to look up the system name and other information that have been set in the comment field for the folder.

It is recommended that this setting method be used when the correspondence between folders and each organization needs only to be maintained for operational purposes.

📓 Note

. . . .

- Do not use this setting method in environments where a cumulative total of 10,000 or more systems are expected to be deployed within a single tenant.
  If a cumulative total of 10,000 or more systems are deployed, the deployment will be executed normally, but a serial number with five or more digits will be added to the folder name.

- If the tenant name exceeds 28 characters, it will become a tenant name with a serial number added to the first 27 characters of the tenant name.

. . . .

Tenant name + system name

This method sets the tenant name followed by the system name specified with the L-Platform management window as the name of the folder corresponding to the L-Platform to be deployed.

🔰 Example

. . . .

The result will be the following kind of string:

```
sosiki1-system1
```

. . . .

Because the system name specified by the user is included within the folder name as shown above, it is easier to find the system within the ROR Console than the "system ID".

However, with this setting method, the string specified for the system name must consist of no more than 23 characters (alphanumeric characters, underscores and hyphens).

It is recommended that this setting method be used if there is no operational requirement to specify Japanese text for system names.

L-Server name

The servers deployed by this product correspond to the L-Servers.

By changing the method for setting L-Server names, the servers deployed by ROR Console can be made to correspond to L-Servers more easily.

Server ID

This method sets the server ID as the name of the L-Server that corresponds to the server to be deployed.

The server ID is a string where a four-digit serial number has been added to the L-Platform ID.

📖 Example

- -

The result will be the following kind of string:

```
sosiki1-WCJFRUH6L-S-0001
```

- -

The server ID is not displayed in the L-Platform management window, and so in order to maintain correspondence between L-Servers and the servers deployed by ROR Console it is necessary to check the IP address and so on.

This setting method is the default setting for this product. It is recommended that this setting method be used in operational situations such as when there is no need to have the servers deployed by ROR Console correspond to L-Servers.

Host name

This method sets the host name (computer name) as the name of the L-Server that corresponds to the server to be deployed.

The host name can be looked up in the operation window for the virtualization software (such as VMware) and in guest operating systems. For this reason, it is recommended that this setting method be used when it is necessary to maintain server correspondence between this product and the virtualization software.

Server name

This method sets the server name specified with the L-Platform management window as the name of the L-Server that corresponds to the server to be deployed.

It is recommended that this setting method be used in situations such as when there is a need to have the servers deployed by this product correspond to L-Servers.

However, with this setting method, the string specified for the server name must consist of no more than 64 characters (alphanumeric characters, underscores and hyphens) that start with an alphanumeric character.

6.5.5 Settings for the Overcommit Function

The overcommit function can virtually allocate more resources to guest operating systems than the total resources (such as CPU or memory resources) installed on the server.

The overcommit function involves specifying the following kind of settings for CPU and memory:

Item name	Content
CPU clock speed	The maximum amount of CPU resources allocated to virtual servers
Reserved CPU clock speed	The minimum amount of CPU resources guaranteed for virtual servers
CPU allotment ratio	The relative allotment ratio for determining the allotment of CPU resources when multiple virtual servers are competing for CPU resources.
Memory size	The maximum amount of memory resources allocated to virtual servers
Reserved memory size	The minimum amount of memory resources guaranteed for virtual servers
Memory allotment ratio	The relative allotment ratio for determining the allotment of memory resources when multiple virtual servers are competing for CPU resources.

📄 Note

- -

- Settings for the overcommit function are required for all L-Server Templates used by this product.

- The only virtualization software that supports the overcommit function is VMware or Hyper-V.

- For virtual servers where the overcommit function has been enabled, resources will be consumed when the virtual server starts. For this reason, if the settings for reserved CPU performance and reserved memory capacity are less than minimum requirements for the operating system to start, the virtual server may fail to start due to insufficient resources.

- Be sure to specify whether to enable or disable the overcommit function before operations commence. This attribute cannot be switched once operations have commenced.

. . . .

How to Use the Overcommit Function

To use the overcommit function, perform the following procedure:

1. Register an L-Server Template.

   Refer to "Chapter 8 L-Server Template Operations" in the *User's Guide for Infrastructure Administrators (Resource Management)* for information on how to create and register L-Server Templates.

2. Set a definition file.

   a. Open the definition file for this product in a text editor.

      The definition file is stored in the following location:

      [Windows]

      [vsys_config.xml]

      ```
      <Installation directory for this product>\RCXCFMG\config\vsys_config.xml
      ```

      [managerview_config.xml]

      ```
      <Installation directory for this product>\RCXCTMG\MyPortal\config\managerview_config.xml
      ```

      [Linux]

      [vsys_config.xml]

      ```
      /etc/opt/FJSVcfmg/config/vsys_config.xml
      ```

      [managerview_config.xml]

      ```
      /etc/opt/FJSVctmyp/config/managerview_config.xml
      ```

   b. Add the following key and value:

      [vsys_config.xml]

Key name	Content
over-commit	no : Disables the overcommit function (the default value). yes : Enables the overcommit function.

      A specification example is shown below:

      ### Example

      . . . .

      ```
      <properties version="1.0">
          :
        <entry key="over-commit">yes</entry>
      ```

      . . . .

      [managerview_config.xml]

Key name	Content
enable-overcommit	false: Disables the overcommit function (the default value). true: Enables the overcommit function.

   c. Save the file.

   d. Restart the manager.
      Refer to "7.2 Starting and Stopping the Manager" in the *Setup Guide CE* for information on how to Restart the manager.

3. Set item values.

   Use the Manager View to set each of the items indicated.

   Refer to "6.3.11 L-Platform Reconfiguration" in the *User's Guide for Tenant Administrators* for details on changing the configuration.

6.5.6 Settings for the Simplified Reconfiguration Function

The simplified reconfiguration function is a function that allows specification changes to be performed for a server, when a new system is being created or when a configuration is being changed after deployment, simply by selecting a server type.

When this function is enabled, individual values cannot be changed directly.

To change the settings for this function, perform the following procedure.

Refer to "6.3.11 L-Platform Reconfiguration" in the *User's Guide for Tenant Administrators* for details on changing the configuration.

1. Open the settings file in a text editor.

   The settings file is stored in the following location:

   [Windows]

```
<Installation directory for this product>\RCXCTMG\MyPortal\config\managerview_config.xml
```

   [Linux]

```
/etc/opt/FJSVctmyp/config/managerview_config.xml
```

2. Add the following key and value:

Key name	Content
enable-easy-reconfigure	false: Disables the function. (This is the default value. This is applicable even when this key is not defined.) true : Enables the function

3. Save the file.

4. Restart the manager.
   Refer to "7.2 Starting and Stopping the Manager" in the *Setup Guide CE* for information on how to Restart the manager.

6.5.7 Distribution Ratio Settings

The distribution ratio settings set a simple selection method for the distribution ratios of CPUs and memory that correspond to the distribution ratio settings of VMware.

Note that the settings are enabled only if the simplified reconfiguration function has been disabled.

To change the settings, implement the following procedure:

Refer to "6.3.11 L-Platform Reconfiguration" in the *User's Guide for Tenant Administrators* for details on changing the configuration.

1. Use the editor to open the settings file.

   The settings file is stored in the following location:

```
<Installation directory for this product>\RCXCTMG\MyPortal\config\managerview_config.xml
```

[Linux]

```
/etc/opt/FJSVctmyp/config/managerview_config.xml
```

2. Add the following keys and values:

Key name	Content
share-easy-setting	false: Directly edits values. (This is the default value. This is applicable even when this key is not defined.) true: Selects from a list box the values to be set that show the distribution ratio of memory. The values to be set are as follows:

Value	Distribution ratio (share)
Low (500)	500
Standard (1,000)	1,000
High (2,000)	2,000

3. Save the file.

4. Restart the manager.
   Refer to "7.2 Starting and Stopping the Manager" in the *Setup Guide CE* for information on how to Restart the manager.

6.5.8 Application Process Settings

This section explains how to modify the application process settings.

6.5.8.1 How to modify the application process settings

This section explains how to modify the setting whether to use the application process.

📌 Note

. . . .

The setting to "use" application process cannot be modified to "not use" once the operation has started.

. . . .

Refer to "6.5 Application Process Settings" in the *Setup Guide CE* for information on how to change the setting for whether or not an application process is used.

6.5.8.2 How to Modify Application Process to be Used

This section explains how to modify the application process to be used.

📌 Note

. . . .

The application process to be used cannot be modified once the operation has started.

. . . .

Refer to "6.5 Application Process Settings" in the *Setup Guide CE* for information on how to change the application process to be used.

Publishing process definition

The publishing procedure of the process definition to be used is as follows.

1. Login from following URL to the Web console of Systemwalker Runbook Automation in the user with system administrator privileges.

```
http://<Systemwalker Runbook Automation installation server>:<port number>/console/Default/
ctmgApplication/
```

2. Select **Process Definitions** in **Process Management** tab. Select the process definition to be used from the process definition list, then click **Publish** from the context menu.

Stopping the manager

Stop the manager.
Refer to "7.2 Starting and Stopping the Manager" in the *Setup Guide CE* for information on how to stop the manager.

6.5.9 Editing the Environment Setup File fot the L-Platform API

Use the following procedure to edit the environment setup file:

1. Edit the environment setup file for the L-Platform APIs:

[command_config.xml]

[Windows]

```
<Installation directory for this product>\RCXCFMG\config\command_config.xml
```

[Linux]

```
/etc/opt/FJSVcfmg/config/command_config.xml
```

Specify the following values:

```
l_platform-api-protcol:<Protocol for communicating with L-Platform API> (*)
l_platform-api-host:<Host name or IP address of server on which L-Platform API operates>
l_platform-api-port:<Port number on which L-Platform API operates>
l_platform-api-uri :<Path on which L-Platform API operates>
```

*: https is set by default. Set a new value if the default value needs to be changed.

A specification example is shown below:

🖼 Example
. . . .
<entry key="l_platform-api-protocol">https</entry>
<entry key="l_platform-api-host">localhost</entry>
<entry key="l_platform-api-port">8014</entry>
<entry key="l_platform-api-uri">/cfmgapi/endpoint</entry>
. . . .

6.5.10 Edit the License Agreement

This section explains how to edit the license agreement that is displayed in the L-Platform management window.

6.5.10.1 Edit the License Agreement when Subscribing to the L-Platform

This section explains how to edit the license agreement that is displayed when applying to use L-Platform.

To edit the license agreement, edit the following file:

[Windows]

```
<Installation directory for this product>\RCXCTMG\MyPortal\config\license\create\default
```

[Linux]

```
/etc/opt/FJSVctmyp/config/license/create/default
```

📓 **Note**

∙∙

- If the file does not exist, the Terms of use window will not be displayed when the service is being subscribed to. The file must not be deleted.

- If the license agreement has been edited, collect a backup of the file after the edit.

∙∙

Settings

The license agreement must be written in the file.

- The character-code of the file is UTF-8.

- When the number of characters exceeds 10000 characters, it might take time to display the Terms of use window.

- The following description is written in the file as the initial value. Edit the file as required to suit your usage.

```
To install and operate, edit the following file.
[Windows]
[Installation directory for this product]\RCXCTMG\MyPortal\config\license\create\default

[Linux]
/etc/opt/FJSVctmyp/config/license/create/default

[Description example]
L-Platform subscription license agreement
...
```

Example of settings

```
L-Platform subscription license agreement
The following actions involving the use of the L-Platform are not permitted.
  To use this L-Platform for personal use
  To use this L-Platform under false identity
```

6.5.10.2 Edit the License Agreement when Reconfiguring the L-Platform

This section explains how to edit the license agreement that is displayed when reconfiguring the L-Platform.

To edit the license agreement, edit the following file:

[Windows]

```
<Installation directory for this product>\RCXCTMG\MyPortal\config\license\reconfigure\default
```

[Linux]

```
/etc/opt/FJSVctmyp/config/license/reconfigure/default
```

📓 **Note**

∙∙

- If the file does not exist, the Terms of use window will not be displayed when reconfiguring the L-Platform. The file must not be deleted.

- If the license agreement has been edited, collect a backup of the file after the edit.

∙∙

Settings

The license agreement must be written in the file.

- The character-code of the file is UTF-8.

- When the number of characters exceeds 10000 characters, it might take time to display the Terms of use window.

- The following description is written in the file as the initial value. Edit the file as required to suit your usage.

```
To install and operate, edit the following file.
[Windows]
[Installation directory for this product]\RCXCTMG\MyPortal\config\license\reconfigure\default

[Linux]
/etc/opt/FJSVctmyp/config/license/reconfigure/default

[Description example]
L-Platform reconfiguration license agreement
...
```

Example of settings

```
L-Platform reconfiguration license agreement
The following actions involving the modification of the L-Platform are not permitted.
  To use this L-Platform for personal use
  To use this L-Platform under false identity
```

6.5.10.3 Edit the License Agreement When Canceling L-Platform

This section explains how to edit the cancellation of the license agreement that is displayed when cancelling L-Platform.

To edit the license agreement, edit the following file:

[Windows]

```
<Installation directory for this product>\RCXCTMG\MyPortal\config\license\return\default
```

[Linux]

```
/etc/opt/FJSVctmyp/config/license/return/default
```

Note

- If the file does not exist, the Terms of cancel window will not be displayed when canceling the subscription. The file must not be deleted.

- If the cancellation of the license agreement has been edited, collect a backup of the file after the edit.

Settings

The license agreement must be described in the file.

- The character-code of the file is UTF-8.

- When the number of characters exceeds 10000 characters, it might take time to display the Terms of cancel window.

- The following description is entered in the file as the initial value. Edit the file as required to suit your usage.

```
To install and operate, edit the following file.
[Windows]
[Installation directory for this product]\RCXCTMG\MyPortal\config\license\return\default

[Linux]
```

```
/etc/opt/FJSVctmyp/config/license/return/default

[Description example]
Cancellation of L-Platform license agreement
...
```

Example of settings

```
Cancellation of L-Platform license agreement
The following action involving the cancellation of the L-Platform is not permitted:
  To cancel this L-Platform under a false identity
```

6.5.11 Settings when RHEL5-Xen is used

When RHEL5-Xen is used as virtualization software, it is necessary to set the default value of MAC address to allocate to virtual servers.

Follow the procedure below to use RHEL5-Xen.

1. Use the editor to open the settings file.

   The settings file is stored in the following location:

   [Windows]

   ```
   <Installation directory for this product>\RCXCFMG\config\vsys_config.xml
   ```

   [Linux]

   ```
   /etc/opt/FJSVcfmg/config/vsys_config.xml
   ```

2. Add the following keys and values:

Key name	Content
default-macaddress	One of the names of the MAC address set resources that have been registered with the resource management

3. Save the file.

4. Restart the manager.
   Refer to "7.2 Starting and Stopping the Manager" in the *Setup Guide CE* for information on how to Restart the manager.

Note

When RHEL5-Xen is used as virtualization software, this setting is necessary.

If it is omitted, L-Platform subscription applications will result in an error and L-Platforms cannot be created.

6.5.12 System Disk Settings for Physical L-Servers

The following explanation describes how to modify settings when using an existing disk as the system disk for the physical L-Server deployed from the L-Platform window.

Point

When using this product's disaster recovery function, it is a requirement that the settings be modified to use an existing disk.

Usage Method

Implement the following procedures when using an existing disk as the physical L-Server system disk:

1. Use the editor to open the settings file.

   The settings file is stored in the following location:

   [Windows]

   ```
   <Installation directory for this product>\RCXCFMG\config\vsys_config.xml
   ```

   [Linux]

   ```
   /etc/opt/FJSVcfmg/config/vsys_config.xml
   ```

2. Add the following keys and values:

Key name	Content
existing-disk-mode	no: Does not use existing disk (This is the default value)
	yes: Uses existing disk

   A specification example is shown below:

Example

. . . .

```
<properties version="1.0">
    :
  <entry key="existing-disk-mode">yes</entry>
```

. . . .

3. Save the file.

4. Restart the manager.
   Refer to "7.2 Starting and Stopping the Manager" in the *Setup Guide CE* for information on how to Restart the manager.

6.5.13 Default Password Setting for Sent Emails

The following explanation describes how to modify settings when determining whether to include a default password for a deployed server within the email that gets sent when deploying an L-Platform and/or adding a server to an L-Platform.

Usage Method

Implement the following procedures when modifying settings to include (or not include) the password:

1. Use the editor to open the settings file.

   The settings file is stored in the following location:

   [Windows]

   ```
   <Installation directory for this product>\RCXCFMG\config\mail_config.xml
   ```

   [Linux]

   ```
   /etc/opt/FJSVcfmg/config/mail_config.xml
   ```

2. Add the following keys and values:

Key name	Content
show-password	true: Include the password (This is the default value)
	false: Do not include the password

   A specification example is shown below:

📖 Example
....

```
<properties version="1.0">
    :
  <entry key="show-password">false</entry>
```
....

3. Save the file.

4. Restart the manager.
   Refer to "7.2 Starting and Stopping the Manager" in the *Setup Guide CE* for information on how to Restart the manager.

6.5.14 Settings for the Maximum Number of Connections for the L-Platform Template

The maximum number of L-Servers that can be placed in an L-Platform Template and the maximum number of NICs in a segment of an L-Platform Template can be modified.

1. Use the editor to open the settings file.

   The settings file is stored in the following location:

   [Windows]

   ```
   <Installation directory for this product>\RCXCTMG\MyPortal\config\managerview_config.xml
   ```

   [Linux]

   ```
   /etc/opt/FJSVctmyp/config/managerview_config.xml
   ```

2. Add the following keys and values:

Key name	Content
maximum-number-of-connections-in-template	Specify the maximum number of L-Servers that can be placed in the L-Platform Template. Without a key, the default value is 30.
maximum-number-of-connections-in-segment	Specify the maximum number of NICs in the segment of the L-Platform Template. Without a key, the default value is 30.

📒 Note
....

If there is a firewall, the maximum number of connections in the segment defined in the rule set will be the smaller value out of the maximum number of servers in the ruleset and the configured value of the "maximum-number-of-connections-in-segment". Segments that are not defined in the firewall rule set will use the configured value.
....

3. Save the file.

4. Restart the manager.
   Refer to "7.2 Starting and Stopping the Manager" in the *Setup Guide CE* for information on how to Restart the manager.

6.6 Settings for Tenant Management and Account Management

This section explains how to change the settings for the tenant management and the account management, and explains how to edit the user agreement that is displayed when registering a user.

6.6.1 Settings for Tenant Management and Account Management

This section explains how to change the settings for the tenant management and the account management.

- Display setting for user list

  This section explains the procedure for changing the setting for whether or not tenant users are to be displayed, when an infrastructure administrators has used the tenant management to display the user list.

- Setting for registration format of tenant users

  This section explains the procedure for changing the setting for whether a provisional account of a tenant user is to be registered or whether the tenant user is to be registered directly, when a tenant administrator registers a tenant user.

- Setting for execution authority of the tenant management

  This section explains the procedure for changing the setting for whether or not a tenant administrator can perform the following tenant management:

    - Add users

    - Delete users

    - Delegate user privileges

    - Set user password

- Password change notification email settings

  This section explains the procedure for modifying the settings when determining whether or not to include a new password within the body of the password change notification email that is sent once password settings are complete, in the event that a tenant administrator sets the user's password.

- Setting for execution authority of the account management

  This section explains the procedure for changing the setting for whether or not a tenant administrator or tenant user can perform the following account management:

    - Changing the user's own information

    - Changing the user's own password

- Directory service operation setting

  This section explains the procedure for changing the setting for whether or not registration to directory service can be performed and for whether or not password modification is to be allowed, when an infrastructure administrators or a tenant administrator registers a user.

Stopping the manager

Stop the manager.

Refer to "7.2 Starting and Stopping the Manager" in the *Setup Guide CE* for information on how to stop the manager.

Tenant Management Settings

The procedure for changing the setting of the tenant management is as follows.

1. Open the following file.

   [Windows]

   ```
   <Installation directory for this product>\RCXCTMG\SecurityManagement\conf\portal.properties
   ```

   [Linux]

   ```
   /etc/opt/FJSVctsec/conf/portal.properties
   ```

2. The following information must be modified:

Setting item	Settings	
visible.tenantuser	Setting for infrastructure administrators operation	Specify "on" if both tenant administrators and tenant users are to be displayed in the user list for the tenant management, and specify "off" if only tenant administrators are to be displayed. The initial value is

Setting item	Settings	
		"on". If "off" has been specified, the tenant users will not be displayed in the User List window of the tenant management.
provisional.acount	Setting for tenant administrator operation	Specify "on" if a provisional account of a tenant user is to be created when the tenant management is to be used to register the tenant user, and specify "off" if the tenant user is to be registered directly. The initial value is "on". If "off" has been specified, the window for directly registering a tenant user will be displayed when registering a tenant user.
allowUpdate		Specify "on" if the tenant management is to be performed, and specify "off" if it is not to be performed. The initial value is "off". If "off" has been specified, the Tenant tab will not be displayed on the ROR Console.
setPassword.tenantadmin.mailwithpasswd		When setting the user's password in tenant management, configure the settings to "on" to include the new password in the body of the password change notification email, or to "off" when not including the password in the email. The default value is set to "on". A new password will be included in the body of the password change notification email in the event that this value is omitted and/or the key is undefined.
leftMenu.modifyUser.admin.visible		Specify "on" if changing user account is to be performed using the account management, and specify "off" if it is not to be performed. The initial value is "on". If "off" has been specified, the Change user account button will not be displayed in the Account window of the account management.
leftMenu.changePassword.admin.visible		Specify "on" if changing user password is to be performed using the account management, and specify "off" if it is not to be performed. The initial value is "on". If "off" has been specified, the Change user password button will not be displayed in the Account window of the account management.
leftMenu.modifyUser.user.visible	Setting for tenant user operation	Specify "on" if changing user account is to be performed using the account management, and specify "off" if it is not to be performed. The initial value is "on". If "off" has been specified, the Change user account button will not be displayed

Setting item	Settings	
		in the Account window of the account management.
leftMenu.changePassword.user.visible		Specify "on" if changing user password is to be performed using the account management, and specify "off" if it is not to be performed. The initial value is "on". If "off" has been specified, the Change user password button will not be displayed in the Account window of the account management.

A setting example is shown below.
If the line in red font below is missing, please add it.

```
    ... omitted
allowUpdate = on
setPassword.tenantadmin.mailwithpasswd=off
    ... omitted
leftMenu.modifyUser.admin.visible=on
leftMenu.changePassword.admin.visible=on
leftMenu.modifyUser.user.visible=on
leftMenu.changePassword.user.visible=on

visible.tenantuser=on
provisional.acount=on
```

3. Open the following directory service operation definition file.

[Windows]

```
<Installation directory for this product>\ROR\SVROR\Manager\etc\customize_data\ldap_attr.rcxprop
```

[Linux]

```
/etc/opt/FJSVrcxmr/customize_data/ldap_attr.rcxprop
```

4. The following information must be modified:

Setting item	Settings	
directory_service	Setting for infrastructure administrators, tenant administrator, and tenant user operation	Specify "true" if user registration to directory service can be performed and password modification is to be allowed when the tenant management is to be used to register a user, and specify "false" if no user registration to directory service is to be performed and no password modification is to be allowed. The initial value is "true". If "false" has been specified, the Set password button will not be displayed in the User List window of the tenant management. In addition, the Change user password button will not be displayed in the Account window of the account management. Note that, if "false" is specified, users must already be registered in the directory service. Refer to "Appendix C User

Setting item	Settings
	Management Using Directory Service" for information on registering users in the directory service.

A setting example is shown below.

```
    ... omitted
directory_service=true
```

Starting the manager

Start the manager.

Refer to "7.2 Starting and Stopping the Manager" in the *Setup Guide CE* for information on how to start the manager.

6.6.2 Editing the User Agreement when Registering a User

This section explains how to edit the user agreement that is displayed in the Register User window when a new tenant user is to perform a registration procedure.

To edit the user agreement, edit the following HTML file:

[Windows]

```
<Installation directory for this product>\IAPS\F3FMihs\servers\FJapache\htdocs\sopdocs\pub\html\ja
\cRegApply_agreement.forUse_en.html
```

[Linux]

```
/var/opt/FJSVihs/servers/FJapache/htdocs/sopdocs/pub/html/ja/cRegApply_agreement.forUse_en.html
```

 Note
. . . .

- If the HTML file does not exist, the Register User window will not be displayed. The HTML file must not be deleted.

- If the user agreement has been edited, collect a backup of the HTML file after the edit.

. . . .

Settings

The user agreement must be written in a section defined with the <body> tag in the HTML file.

- Edit according to the HTML syntax.

- Only the section defined with the <div> tag can be edited. Do not edit a section outside the <div> tag. When a section outside the <div> tag is edited, the user agreement may not be displayed properly when a user is added.

- The following is written as the initial value in the section defined with the <div> tab in the HTML file. Edit the section as required to suit your usage.

```
<body>
<div id="iframeHeight" style="font-size:small;">
To install and operate, edit the following file.<br>
[Windows]<br>
  [Interstage Application Server installation directory]\F3FMihs\servers\FJapache\htdocs
\sopdocs\pub\html\en\cRegApply_agreement.forUse_en.html<br>
<br>
[Linux]
  /var/opt/FJSVihs/servers/FJapache/htdocs/sopdocs/pub/html/en/
cRegApply_agreement.forUse_en.html<br>
<br>
[Description example]<br>
<br>
```

```
Article 1 GENERAL RULES <br>
<br>
Section 1 (Application of User Agreement)
This agreement defines the conditions required to grant the user the use of XXXX service (hereafter
referred to as "the service") supplied by XXXX. <br>
   <br>
   <br>
   <br>
<br>
Supplementary provision <br>
1.This agreement takes effect on 20XX/XX/XX. <br><br>
</div>
</body>
```

Example of settings

```
<body>
<div id="iframeHeight" style="font-size:small;">
The following actions involving the use of the service are not permitted.<br>
<br>
   To collect personal information other than that of one's own through fraudulent means or without
agreement of the owner of the information<br>
   To falsify or delete information that this service may use<br>
   To use this service under false identity<br>
<br>
Supplementary provision<br>
1.This agreement takes effect on 1 November 2011.<br><br>
</div>
</body>
```

6.7 Accounting Settings

This section explains how to modify the accounting settings.

6.7.1 Display Function Settings for Estimated Price

Usage fee (the estimated price) for the L-Platform template can be displayed in the L-Platform Management window based on L-Platform
template accounting information.
This section describes how to modify settings according to whether usage fee (the estimated price) for the L-Platform template will be
displayed.

Procedures to modify the settings are as follows:

1. Open the following file.

    [Windows]

    ```
    <Installation directory for this product>\RCXCFMG\config\vsys_config.xml
    ```

    [Linux]

    ```
    /etc/opt/FJSVcfmg/config/vsys_config.xml
    ```

2. The following information must be modified:

Key	Description	Default value
use-charge	Specifies whether usage fee (the estimated price) for the L-Platform template will be displayed. - yes: Display - no: Do not display	no

A setting example is shown below.

```
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE properties SYSTEM "http://java.sun.com/dtd/properties.dtd">
<properties>
   ... omitted
    <entry key="use-charge">yes</entry>
    <entry key="charge-host">localhost</entry>
    <entry key="charge-port">3550</entry>
    <entry key="charge-uri">/resource/ver1.0</entry>
    ... omitted
</properties>
```

3. Open the following file.

   [Windows]

   ```
   <Installation directory for this product>\RCXCTMG\MyPortal\config\custom_config.xml
   ```

   [Linux]

   ```
   /etc/opt/FJSVctmyp/config/custom_config.xml
   ```

4. The following information must be modified:

Key	Description	Default value
estimation-mode	Specifies whether usage fee (the estimated price) for the L-Platform template will be displayed. - 3: Display - 0: Do not display Set to "3" if **use-charge** in vsys_config.xml is set to "yes", or to "0" if **use-charge** is set to "no".	0
compatible-estimation (*1)	When overcommit is enabled, specify whether to calculate usage fee (the estimated price) using the operating value or the reserved value. - true: Calculate using operating value (CPU performance and/or memory capacity) - false: Calculate using reserved value (reserved CPU performance and/or reserved memory capacity)	false

*1) These settings are only valid when the overcommit function is enabled. Refer to "6.5.5 Settings for the Overcommit Function" for further details.
Note also that these settings are only valid when either VMware or Hyper-V is used as the virtual software. If any other virtual software is used, the usage fee (the estimated price) will be calculated using the operating value regardless of whether or not overcommit is enabled or disabled.

A setting example is shown below.

```
<?xml version="1.0" encoding="UTF-8"?>
<properties>
    <entry key="estimation-mode">3</entry>
    <entry key="compatible-estimation">true</entry>
    ... omitted
</properties>
```

5. Restart the manager.

   Refer to "7.2 Starting and Stopping the Manager" in the *Setup Guide CE* for information on how to Restart the manager.

6.7.2 Currency Information Settings

Currency information can be changed. Default setting is USD ($).

The currency that can be used is shown below.

Currency	Currency sign	Number of decimal places
United States Dollar	$	2
Japanese Yen	¥	0
Euro	EUR	2
Singapore dollar	S$	2

To change the currency information, perform the following procedure:

1. Stop the manager.
   Refer to "7.2 Starting and Stopping the Manager" in the *Setup Guide CE* for information on how to stop the manager.

2. Execute the Change currency information setting command to change the currency information.
   Refer to "3.5 currencyset (Change Currency Information Setting)" in the *Reference Guide CE* for information on how to use the Change currency information setting command.

3. Start the manager.
   Refer to "7.2 Starting and Stopping the Manager" in the *Setup Guide CE* for information on how to start the manager.

📗 Note

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Determine the currency used when installing the system.

Do not change the currency information once the operation starts.

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6.7.3 Metering Log Settings

This section explains how to change the metering log operational settings.

Follow the steps below to change the metering log operational settings.

1. Open the following operational settings file for metering logs:

   [Windows]

   ```
   <Installation directory for this product>\RCXCTMG\Charging\conf\metering_log.properties
   ```

   [Linux]

   ```
   /etc/opt/FJSVctchg/conf/metering_log.properties
   ```

2. Change the relevant items in the operational settings file for metering logs:

Key	Description	Default value
retention_period	Retention period of log entries Logs will be deleted once their retention period has passed. Use the following format to specify the retention period: YYYY-MM-DD Example: 0000-03-00: Retain logs for 3 months. 0005-00-00: Retain logs for 5 years.	0000-03-00

Key	Description	Default value
periodic_log_use (*1)	Specify whether or not to use the periodic log function: - yes: Use - no: Do not use	yes
periodic_log_schedule_time (*1)	Output time of periodic log Use the following format to specify the output time: HH:mm	00:00
periodic_log_schedule_type (*1)	Output frequency of periodic log Specify one of the following strings: - DAILY: Every day - WEEKLY: Every week - MONTHLY: Every month	DAILY

periodic_log_schedule_day (*1)	Output day of periodic log
	
	If periodic_log_schedule_type is WEEKLY or MONTHLY, this item is mandatory.(*2)
	
	- If periodic_log_schedule_type is WEEKLY:
	Use the following strings to specify the day of the week:
	
	  - MON
	
	  - TUE
	
	  - WED
	
	  - THU
	
	  - FRI
	
	  - SAT
	
	  - SUN
	
	Commas can be used as delimiters to specify a number of days of the week.
	
	- If periodic_log_schedule_type is MONTHLY:
	Use one of the following methods to specify a date:
	
	  - Numerics from 1 to 28 indicating the date
	
	  - LASTDAY string indicating the last day of the month
	
	A number of days cannot be specified with this method.
		No specification

*1: Changes to this setting are enabled by executing the Change periodic log schedule settings command after changing the settings file.

*2: If periodic_log_schedule_type is DAILY, the periodic_log_schedule_day value will be ignored.

An example of setting the operational settings file is shown below:

```
# delete setting of meteringlog database
# YYYY-MM-DD
# ex. 3 months ago     0000-03-00

retention_period=0000-03-00
```

```
# schedule of periodlog insert

periodic_log_use=yes

periodic_log_schedule_time=00:00

periodic_log_schedule_type=DAILY

periodic_log_schedule_day=
```

3. If an item other than retention_period has been changed, execute the Change periodic log schedule settings command.
   Refer to "3.3 ctchg_chgschedule (Change Periodic Log Schedule Settings)" in the *Reference Guide CE* for information on the Change periodic log schedule settings command.

6.8 System Condition Server List Settings

This section explains how to change the System Condition Server List settings.

If the L-Platform Management overcommit function is enabled, the CPU and memory settings displayed in the System Condition Server List can be changed. Refer to "6.5.5 Settings for the Overcommit Function" for information on the L-Platform Management overcommit function settings.

Note

If the overcommit function is used, the settings must match those of the L-Platform Management overcommit function.

Use the procedure below to change the System Condition Server List settings.

1. Open the following file:

   [Windows]

   ```
   <Installation directory>\SWRBAM\CMDB\FJSVcmdbm\CMDBConsole\WEB-INF\classes\viewlist_en.xml
   ```

   [Linux]

   ```
   /opt/FJSVcmdbm/CMDBConsole/WEB-INF/classes/viewlist_en.xml
   ```

2. Set the following items:

Settings item	Explanation
serverByOrg_ROR.bottom.column.11.isEnable	Set "true" to display the CPU Reserve Clock Rate. Set "false" to hide it.
serverByOrg_ROR.bottom.column.14.isEnable	Set "true" to display the Memory Reserve Size. Set "false" to hide it.

A settings example is shown below.

```
<?xml version="1.0" encoding="UTF-8"?>
<properties>
    ... omitted
<entry key="serverByOrg_ROR.bottom.column.11.isEnable">false</entry>
<entry key="serverByOrg_ROR.bottom.column.11.label">Reserved CPU clock speed(GHz)</entry>
<entry key="serverByOrg_ROR.bottom.column.11.path">/cmdb:item/cmdb:record[@type='observed']/
rc:LogicalServer/@reservedCPUClock</entry>
<entry key="serverByOrg_ROR.bottom.column.11.width">135</entry>
    ... omitted
<entry key="serverByOrg_ROR.bottom.column.14.isEnable">false</entry>
<entry key="serverByOrg_ROR.bottom.column.14.label">Reserved memory size(GB)</entry>
<entry key="serverByOrg_ROR.bottom.column.14.path">/cmdb:item/cmdb:record[@type='observed']/
```

```
rc:LogicalServer/@reservedMemorySize</entry>
<entry key="serverByOrg_ROR.bottom.column.14.width">140</entry>
     ... omitted
</properties>
```

📂 **Note**

. . . .

- If the L-Platform Management overcommit function is disabled, when the viewlist_en.xml overcommit setting is enabled, the CPU Reserve Clock Rate and the Memory Reserve Size columns are displayed but the values are not displayed.

- When editing the viewlist_en.xml file, do not change any settings items other than serverByOrg_ROR.bottom.column.11.isEnable and serverByOrg_ROR.bottom.column.14.isEnable.

- Save the viewlist_en.xml file before you edit the file. If any settings other than serverByOrg_ROR.bottom.column.11.isEnable and serverByOrg_ROR.bottom.column.14.isEnable are changed, restore the saved file.

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6.9 Settings for Event Log Output for CMDB Agent

This section explains how to change the settings that determine whether the start/end messages for CMDB agent information collection are output to event logs.

Use the following procedure to change the settings that determine whether to prevent start/end messages from being output to event logs or not.

1. Open the following files

    [Windows]

    ```
    <Installation directory for this product>\SWRBAM\CMDB\FJSVcmdbm\axis2\WEB-INF\services\mdr_cfmg
    \cmdb.properties
    <Installation directory for this product>\SWRBAM\CMDB\FJSVcmdbm\axis2\WEB-INF\services\mdr_ror
    \cmdb.properties
    ```

    [Linux]

    ```
    /opt/FJSVcmdbm/axis2/WEB-INF/services/mdr_cfmg/cmdb.properties
    /opt/FJSVcmdbm/axis2/WEB-INF/services/mdr_ror/cmdb.properties
    ```

2. Set the following items:

    - schedule.syslog.disable

    Change the value above. A modification example is shown below. Change the part in italics.
    Set this item to "true" to prevent start/update messages from being output to event logs, or "false" otherwise.

    ```
    schedule.syslog.disable=true
    ```

3. Restart the CMDB.

    Open a command prompt and execute the following commands:

    [Windows]

    ```
    <Installation directory for this product >\SWRBAM\CMDB\FJSVcmdbm\bin\cmdbstop
    <Installation directory for this product >\SWRBAM\CMDB\FJSVcmdbm\bin\cmdbstart
    ```

    [Linux]

    ```
    /opt/FJSVcmdbm/bin/cmdbstop.sh
    /opt/FJSVcmdbm/bin/cmdbstart.sh
    ```

Part 3   Maintenance by Infrastructure Administrators

Chapter 7 Hardware Maintenance

This chapter explains how to maintain hardware.

For details on hardware maintenance, refer to "Chapter 9 Hardware Maintenance" of the "Operation Guide VE".

For Servers not Using Server Management Software

When replacing an entire server, a CPU, or memory, if there are differences in the CPU or memory specifications before and after the replacement, reflect the new CPU and memory specifications of the replaced server in the definition file before reconfiguring hardware information.

- For virtual L-Servers

  For details on definition files, refer to "Configuration when Creating a Virtual L-Server on a Server where ServerView Agents cannot be Used" in "E.1.1 Definition Files" of the "Setup Guide CE".

- For physical L-Servers

  For details on definition files, refer to "Configuration when Creating a Physical L-Server without Specifying a Model Name in the L-Server Template" in "D.5.1 Definition Files" of the "Setup Guide CE".

In the following cases, reflect the correct value on the definition file before reconfiguring the hardware information.

- When defining the configuration information (CPU core count, CPU clock speed, memory capacity, etc.) of the target server after registering it with Resource Orchestrator

- When modifying the configuration information (CPU core count, CPU clock speed, memory capacity, etc.) of a server that has been registered with Resource Orchestrator, in the definition file

For reconfiguring hardware properties, refer to "For rack mount or tower servers" in "9.3 Re-configuring Hardware Properties" in the "Operation Guide VE".

7.1 Network Device Maintenance

This section explains how to maintain network devices that are the target of management in Resource Orchestrator.

7.1.1 Replacement Procedure of Network Devices

This section explains the procedure to replace network devices when it becomes necessary due to failure.

Figure 7.1 Image of Network Device Replacement
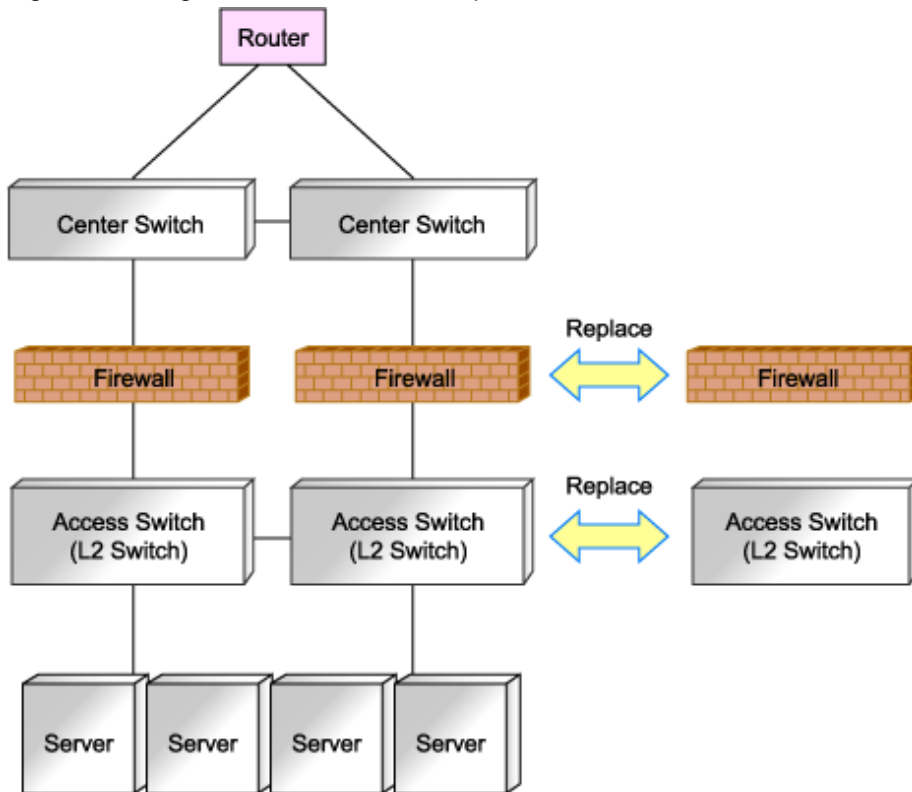
Use the following procedure, when performing replacement while continuing operations using the network devices of redundancy configurations to switch active or standby.

When there is no description, the following operations are performed by an infrastructure administrator.

1. Announcement of planned maintenance operations.

2. Log in the network device directly to check if the target network device of replacement is in active status or standby status.

   When the target network device of replacement is in active status, switch over the device with the standby network device of redundancy configuration, and change the status of target network device for replacement from active status to standby status.

3. Change the target network device to the "maintenance mode".

4. Back up the current environment (such as definitions) from the network devices that are switched to "maintenance mode".

5. Replace the network devices. (Hardware maintenance person)

6. Restore the environment backed up in 4. to the network device after replacement.

7. Back up the current definitions from the network devices with operational status.

8. Check that there are no differences in the definitions in the redundancy configurations using environments backed up in 7. and environment definitions backed up in 4.

   When there is difference that is a problem, log in to the network device directly after replacement, and resolve the difference.

9. Release the "maintenance mode" of network devices, when problems with network devices after replacement have been solved.

10. Notification that maintenance operations are complete.

📖 See
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For details on how to configure and release the maintenance mode, refer to "14.1 Switchover of Maintenance Mode" of the "User's Guide for Infrastructure Administrators (Resource Management) CE".
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📒 Note
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- Replacement using the same model is a prerequisite when replacing network devices.

- Confirm the following items, using the manuals of network devices, in advance.

    - The replacement procedure when using redundancy configurations

    - The operations for network devices (status switchover, backup methods and restore methods)

    - Environmental differences which become problems when configuring redundancy configurations

- When using the network devices of redundancy configurations, replace network devices in the following order.

    1. Replace network devices with standby status

    2. Set the status of the network device before replacement to standby, and replace the device

    When replacing multiple network devices of redundancy configurations simultaneously, perform replacement operations in units of the same redundancy configurations.

- When the network device to replace has failed, step 4. cannot be performed. It is recommended to back up environments regularly in preparation for failures of network devices.

    When performing regular backup of environments, the load of restoration operations after replacement of network devices can be reduced, by using the latest backup environment.

....

7.1.2 Regular Maintenance Procedure of Network Devices

This section explains the procedure of regular maintenance (patch application or firmware update) of network devices.

Use the following procedure when performing maintenance operations while continuing operations using the network devices of redundancy configurations by switching between active and standby.

When there is no description, the following operations are performed by an infrastructure administrator.

1. Announce that regular maintenance operations are being started.

2. Confirm that the network device that is the target of regular maintenance is in standby status, by directly logging in to the network device.

3. Back up the current definitions from the network device with standby status.

4. Change the target network device in standby status to "maintenance mode".

5. A hardware maintenance person performs the regular maintenance operations for network devices (batch application or firmware update).

6. Back up the current definitions from the network devices with operational status.

7. Check that there are no differences between the definitions backed up in 3. and the definitions backed up in 6. When there is difference that is a problem, log in to the network device with standby status, and resolve the difference.

8. Release the network device from "maintenance mode", after checking that problems with network devices with standby status have been solved.

9. Switch over the network device in active status that is the target of regular maintenance and the network device of the redundancy configuration which is in standby status.

10. Then change the status of the remaining network device that is the target of regular maintenance from operational status to standby status, and perform steps 3. to 8.

11. Announce that maintenance operations are complete.

See

For details on how to configure and release the maintenance mode, refer to "14.1 Switchover of Maintenance Mode" of the "User's Guide for Infrastructure Administrators (Resource Management) CE".

Note

- Regular maintenance may not be able to be performed using the described procedure depending on the maintenance details for individual network devices. Before performing regular maintenance operations, ensure you check the information provided from the network device vendors regarding the maintenance operations of network devices.

- Confirm the following items, using the manuals of network devices, in advance.

  - The operations for network devices (status switchover or backup methods)

  - Environmental differences which become problems due to redundancy configurations

- When performing regular maintenance for multiple network devices of redundancy configurations simultaneously, perform replacement operations in units of the same redundancy configurations.

Chapter 8 Backup and Restoration of Admin Servers

This chapter describes how to operate the backup and restoration of the admin server of ServerView Resource Orchestrator Cloud Edition (referred to as "this product" in this guide).

Backing up the Admin Server

The two methods of backing up the Management Server are shown below.

With either method, backup can be performed by executing one command (the rcxmgrbackup command).

Refer to "1.8.11 rcxmgrbackup" in the "Reference Guide (Resource Management) CE" for information on the rcxmgrbackup command.

- Offline backup

  The manager of this product is stopped and then resources are backed up. A backup is taken at the following times:

    - When installation of this product has completed

  When using an offline backup, backup of the following resource is not performed:

    - Audit log

- Online backup

  Resources are backed up without the manager of this product being stopped. Backing up periodically is recommended for online backups.

  To save time when restoring configuration information at operation, take an online backup if configuration information is to be updated.

  When using an online backup, backup of the following resources is not performed:

    - Dashboard information

    - Operational status information

    - Audit log

    - Application information

    - Definition file

        - Some L-Platform management settings

        - Tenant management and account management settings

        - Operational status server list settings

        - CMDB agent event log output settings

  Online backup uses the PostgreSQL Point-In-Time Recovery (PITR) mechanism.

  There are two online backup methods, each with a different database collection range, as follows:

    - Base backup

      Base backup is the backup of the entire database cluster (file group in which database data is recorded). A base backup is taken by executing the rcxmgrbackup -base command.
      Refer to "Base backup" in "8.3 Online Backup of the Admin Server" for details.

    - Differential backup

      With differential backup, the contents of updates to the database are output to multiple files in 16 MB-sized lots.
      These files are called Write-Ahead Logging (WAL) files.

      Usually, for each 16 MB written, the WAL file being written to is switched, and the WAL file for which writing has completed is saved to the "wal" directory under the backup directory.

      Periodically executing the rcxmgrbackup command allows the contents of updates to the database that are recorded in saved WAL files to be maintained for a certain period of time. For example, when the rcxmgrbackup command is executed every hour, the contents of updates performed in the most recent one-hour period will be saved.

Refer to "Differential backup" in "8.3 Online Backup of the Admin Server" for details.

Restoring the Admin Server

Database restoration restores by applying to the base backup the contents of updates to the database in WAL files that have been output after the base backup was taken. The rcxmgrrestore command is used for restoration.

Refer to Section "8.4 Restoration of the Admin Server" for details.

8.1 Mechanism of Backup and Restoration

This section describes the mechanism of backup and restoration, including environment requirements, points to note, and the restart position after restoration, in a system in which this product is installed.

Backup and restoration environment requirements

The following conditions must be satisfied in the environments to be backed up and restored:

- The operating systems match.
  Note that this does not include operating system version differences.

- The host information (host name or IP address) matches.

- The character code systems match.

- The directory services match.

- The product installation folders match.

Points to note at backup and restoration

This section describes the points to note when backup and restoration is being performed.

- Administrator privileges are required in order to execute the commands.

- If, and only if, resources backed up using online backup are to be restored, execute the command that disables a service application for which an application process no longer exists (recoverAllService command).

- Perform backup and restore operations as described below for ServerView Operations Manager, which is mandatory software. Refer to a ServerView Operations Manager manual for details.

    - Backup operations

    Perform system backup in accordance with Management Server system backup operations.

    When a registration or update of user information has occurred, perform backup again

    - Restoration operations

        a. Perform restoration of the entire Management Server system.

        b. Use the restoration procedure described in this document to perform restoration.

- If systems backed up using offline and online backup are to be restored, perform restoration in the following order:

    1. Restoration of systems backed up using offline backup

    2. Restoration of systems backed up using online backup

- When moving backup resources, move the folder specified in the backup destination as well as all folders and files under that folder.

- Do not delete backup resources during execution of the restore command.

- To delete backup resources, delete the folder specified in the backup destination as well as all folders and files under that folder.

- Backup to the following media cannot be performed using the backup command:

  - Backup to optical disks such as CD-R and DVD-R
    To back up user resources to optical disks, back up once to local disks, and then write to the media.

  - Backup to folders that include spaces.

- Restoration from the following folders cannot be performed using the restore command:

  - Restoration from folders that include spaces.

Resources managed by this product and timing of update

The resource files managed by Resource Orchestrator are as shown below: When an operation described in the 'timing of update column' has been performed, a backup should be made.

Table 8.1 Resources to be backed up and timing of update

Target Resources	When Backup is Necessary	Necessity of Stopping Managers	Remarks
Certificates	None	No	
Session encryption keys	After password saving (after execution of the rcxlogin -save command)	No	
System images and cloning images	After addition, deletion, and modification of Physical L-Server images	No	Backup of system images and cloning images of virtual L-Servers are performed as a part of virtual machine backup operations. Perform backup operations of virtual machines using the corresponding functions of VM management software.
Configuration definition information	After creation, registration, modification, unregistration, and deletion of L-Servers and resources	No	
Information related to image files	Physical L-Server registration, deletion, movement. usage changes, power operations, conversion, and reversion After the registration and unregistration of VM hosts	No	
Definition files	Modification of definition files	No (Note)	Note) If the following definition files are to be backed up, the Manager must be stopped and offline backup must be performed. - Some L-Platform management settings - Tenant management and account management settings - Operational status server list settings - CMDB agent event log output settings

Target Resources	When Backup is Necessary	Necessity of Stopping Managers	Remarks
Image management information	After rcxadm imagemgr command operations	No	
Metering information	Creation, change, deletion, move, or power operation of an L-Platform or L-Server	No	
Home window announcement information	Announcement change	Yes	
License agreement when users are added	License agreement change	Yes	
Dashboard information	As required	Yes	Because it is updated as needed, stop the Manager and take a backup as required.
Operational status information	As required	Yes	Because it is updated as needed, stop the Manager and take a backup as required.
Application information	Application to use, modify, or cancel an L-Platform, or approval, assessment, dismissal, or cancellation of application	Yes	
Terms of use or terms of cancellation of L-Platform	Change to terms of use or terms of cancellation	Yes	

Disk space necessary for the backup

Disk space necessary for the backup is as follows.

Table 8.2 Resource to be backed up and disk space necessary for the backup

Target Resources	Disk space necessary for the backup
Configuration definition information	The file size of backup files varies depending on the number of resources defined in the configuration definition information. When the number of VM guests is 1000VM, collection information temporarily becomes about 150MB. It becomes less than 2MB by compressing it. Please prepare the backup area referring to this size.
System image or cloning image	Every time, when backing up, it is necessary. Therefore, when the backup is executed three times for instance, the capacity of image save area is three times necessary. Please refer to "1.4.2.5 dynamic disk space" in the "Setup Guide VE" for the capacity of image save area.
Certificates Session cryptography key Definition files Image management information Home window announcement information License agreement when users are added Terms of use or terms of cancellation of L-Platform	The size of the file backed up changes according to the number of files backed up. Please prepare the backup area referring to this size to need only the area of less than 1MB even if these 100 files are stored by 10KB or less any file.
Metering information	[Offline backup]

Target Resources	Disk space necessary for the backup
	The size increases and decreases to the file backed up in proportion to the increase and decrease at the number of resources of metering objects and the retention period of the metering log. (*1) [Online backup] 1KB(*1)
Dashboard information	The size increases and decreases to the file backed up in proportion to the increase and decrease of the number of L-Server templates and the number of tenants. Please prepare the backup area referring to the following formulas when the dicker is defined in the L-Server template. When the number of tenants is 100, about 6.6GB is necessary. disk space = (67.0 + (55.5 number of * tenants)) * 1.2 (MB)
Operational status information	The size increases and decreases to the file backed up in proportion to the increase and decrease of the number of hosts and the number of guests of VM. Moreover, capacity is different according to the VM management product. Please prepare the backup area referring to the following formulas. About 19.4GB(VMWare, 50 hosts, and 1000VM (20VM/host)) is necessary. disk space = ((N1 * hosts) + (N2 * guests)) * 1.2(MB) [VMware] N1 = 2.0, N2=7.0 [Hyper-V] N1 = 92.0, N2 = 26.0 [Xen/KVM] N1 = 102.0, N2 = 7.0
Application information	The size increases and decreases to the file backed up according to the operating environment. Please calculate the total of the amount of disk under the control of the following directories, and prepare the backup area of the amount. [Windows] - C:\SWRBADB - Installation_folder\SWRBAM - Installation_folder\SWOMGR [Linux] - /etc/opt/FJSVswrbam - /var/opt/FJSVswrbam - /var/opt/FJSVJMCMN/etc - /var/opt/FJSVjmcal - /var/opt/FJSVJOBSC - /var/opt/FJSVfwseo/config/JM - /opt/FJSVJOBSC/bin - /etc/mjes - /var/spool/mjes

*1: The backup of metering information is gathered under the control of the directory specified by the rcxmgrbackup command at an off-line backup, and it is gathered in the area besides the specified directory at an online backup.

Please calculate a necessary amount of disk by backing up metering information referring to the following examples.

"Amount of disk necessary for the base backup" is necessary for an off-line backup.

It is necessary to total "Amount of disk necessary for the base backup" and "Amount of disk necessary for Difference backup" for an online backup.

In the following conditions, the amount of disk of about 12.6GB is necessary for about 1.3GB and online backups for an off-line backup.

Table 8.3 Condition necessary for backup of metering information

Items		Assumption value
Operating number of L-Platforms		1000
Number of resources per L-Platform	L-Server	1
	Advanced Disk	1
	Software	2

Operation Status		- The following executions of every day
		
		   - Return and disposition of ten L-Platforms
		
		   - 1000 L-Server is started at start of work
		
		   - When starting work, 1000 L-Server is stopped
		
		- A regular log is acquired every day
		
		- The metering log is maintained for one year

Frequency of online backup		- The base backup for each of one month (the 30th) is executed. - Difference backup is executed every hour.

Table 8.4 Formula of log of metering each day

- Standard of metering log capacity

   - Event log of L-Platform: 2.3 KB/time (A)

   - Event log against besides L-Platform : 0.6KB/time (B)

   - Regular log: 2.3 * number of L-Platform (KB) (C)

- Log of metering each day

(A) * Frequency of operation to L-Platform each day
+ (B) * Frequency of operation against besides L-Platform each day
+ (C) Number of L-Platform in which * is operated

= 2.3KB * 20 + 0.6KB * 2000 + 2.3KB * 1000
= 3.5MB

Table 8.5 Disk space formula necessary for base backup

Log of the metering each day * For one year

3.5MB * 365 = 1.3GB

Table 8.6 Disk space formula necessary for Difference backup

disk space per WAL file : 16MB

WAL file space frequency until acquiring base backup (30 days): 24 * 30

16MB * 24 * 30 = 11.3GB

Table 8.7 Disk space formula necessary for operation of online backup

Disk space formula necessary for operation of online backup
= Disk space formula necessary for base backup + Disk space formula necessary for Difference backup
= 1.3GB + 11.3GB
= 12.6GB

Storage destination for backing up resources

This section describes the storage destination for backing up Admin Server resources.

Use the rcxmgrbackup command to specify a storage destination folder, except in the case of metering information.

The folders described in the following table are automatically created in the storage destination folder in order to store the resources. When restoration is to be performed, restoration occurs from the information in the latest folder of each folder. Therefore, even if a folder is deleted due to the disk capacity status, this will not cause a problem because the information in the latest folder will remain.

When the rcxmgrbackup command is used with the -cleanup option specified, all information older than the latest information collected by the command will be deleted.

Table 8.8 Relationship between backup method and data collected

Folder	Offline backup	Online backup (base backup)	Online backup (differential backup)
CTMG_OFFyyyymmddhhmmss	Yes	No	No
CTMG_BASEyyyymmddhhmmss	No	Yes	No
CTMGyyyymmddhhmmss	No	No	Yes
CFMGyyyymmddhhmmss	Yes	Yes	Yes
RORyyyymmddhhmmss	Yes	Yes	Yes
RBAyyyymmddhhmmss	Yes	No	No
RORSCW	Yes	Yes	Yes

"yyyymmddhhmmss" is the date and time the command was executed.

Note

Backup files of the admin server should be stored on external storage media to prevent the backup data from being corrupted due to server failure.

Refer to "8.5 Online Backup Settings for Metering" for information on the storage destination for metering.

Standard at backup and restore processing time

Estimate the time that hangs to the backup restoration of the administrative server referring to the following command processing time.

The command processing time must be different according to customer's environment, and gather by the operational testing etc. in customer's environment, and decide the operation estimate time according to the value.

Example

- Environment

    - CPU : 4CPU

    - Memory Size : 16GB

- Command processing time

  - offline backup : 3 minutes

  - online backup (base backup) : 2 minutes

  - online backup (differential backup) : 2 minutes

  - restore : 4 minutes

System restart point after restoration

In the system operations flow used by this product, the restart point of the system will vary according to the timing of the backup of resources. Therefore, to ensure that the system can restart from the status it had before backup, operate the system in accordance with whether offline backup or online backup is used for backup, and perform restoration processing in accordance with each backup type.

Figure 8.1 Schedule for Backup and Restoration of Admin Servers (Example)
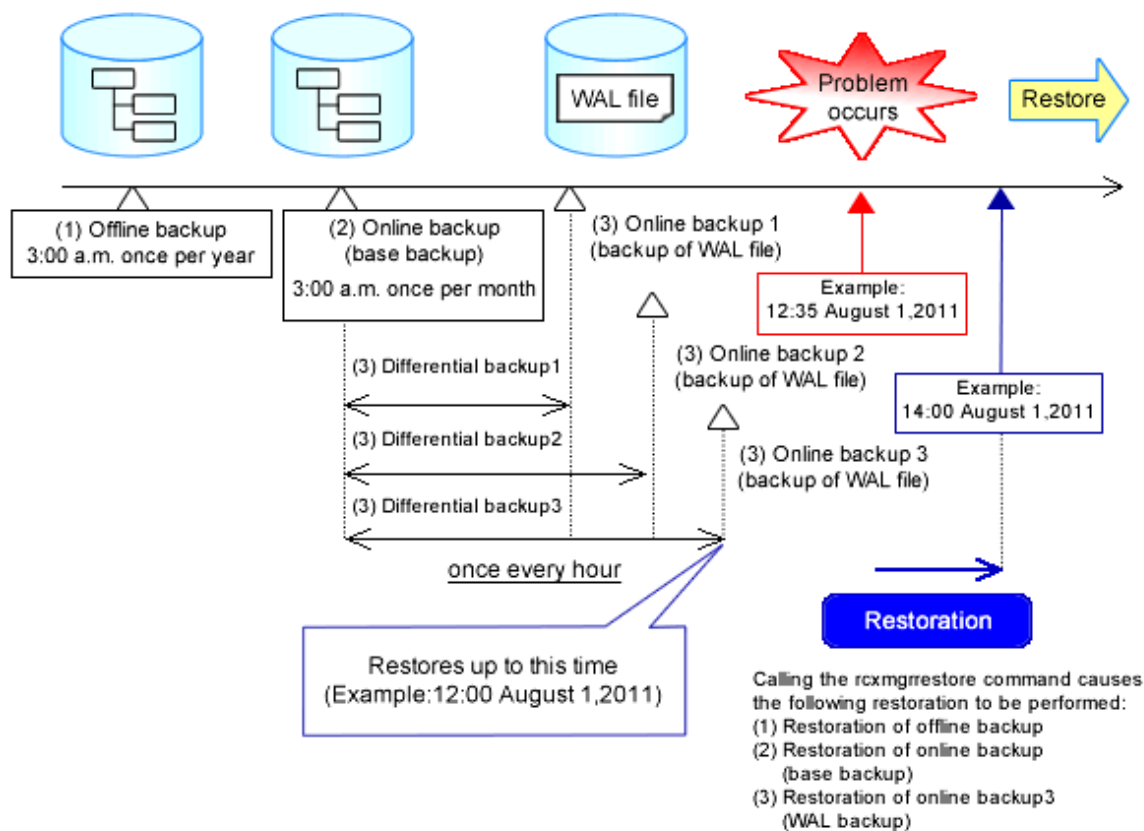
The flow of the preceding diagram is as follows:

1. A problem occurs in the system (Example: Occurs at 12:35 on August 1, 2011)

2. In order to restore the system, restoration is performed on the environment backed up offline and the environment backed up online.

   (Example: Restores at 14:00 on August 1, 2011)

   Refer to "Points to note at backup and restoration" for information on the restoration order.

3. The latest differential backup files are dated (12:00 on August 1, 2011), so the restart point will be from that date and time.

8.2 Offline Backup of the Admin Server

Before performing backup, the systems of this product must be stopped.

1. Stop the manager

2. Back up the resources of this product

3. Start the manager

8.2.1 Stopping the Manager

Stop the Manager and check that it is in a stopped state.

Stopping the Manager

Execute the command shown below to stop the Manager.

Refer to "1.7.16 rcxmgrctl" of the "Reference Guide (Resource Management) CE" for information on the command.

[Windows]

```
>Installation_folder\SVROR\Manager\bin\rcxmgrctl stop <RETURN>
```

[Linux]

```
# /opt/FJSVrcvmr/bin/rcxmgrctl stop <RETURN>
```

Checking the status of the services of this product

Check that the Manager and services of this product are stopped.

Refer to Section "7.2 Starting and Stopping the Manager" of the "Setup Guide CE" for information on how to check this.

8.2.2 Backing Up the Resources of Resource Orchestrator

Back up the resources of this product. Execute the command shown below.

Refer to "1.8.11 rcxmgrbackup" of the "Reference Guide (Resource Management) CE" for information on the command.

[Windows]

```
>Installation_folder\SVROR\Manager\bin\rcxmgrbackup -dir directory [-cleanup] <RETURN>
```

[Linux]

```
# /opt/FJSVrcvmr/bin/rcxmgrbackup -dir directory [-cleanup] <RETURN>
```

8.2.3 Starting the Manager

Execute the command shown below to start the Manager.

Refer to "1.7.16 rcxmgrctl" of the "Reference Guide (Resource Management) CE" for information on the command.

[Windows]

```
> Installation_folder\SVROR\Manager\bin\rcxmgrctl start <RETURN>
```

[Linux]

```
# /opt/FJSVrcvmr/bin/rcxmgrctl start <RETURN>
```

Saving image management information

Check the following image management information, the number of stored snapshot generations and the image file storage folder:

- Number of stored snapshot generations

- Image file storage folder

  Execute the following command to set the number of stored snapshot generations and the image storage folder information to a standard output, by redirecting the information to a file, and then saving it.

  [Windows]

  ```
  > Installation_folder\SVROR\Manager\bin\rcxadm imagemgr info > file <RETURN>
  ```

  [Linux]

  ```
  # /opt/FJSVrcvmr/bin/rcxadm imagemgr info > file <RETURN>
  ```

Parameter

  file

    Specify the name of the file for output.

Refer to "5.5 rcxadm imagemgr" of the "Command Reference" for information on the rcxadm imagemgr command.

8.3 Online Backup of the Admin Server

This section describes online backup of the Management Server.

When using online backup of the Management Server, the PostgreSQL Point-In-Time Recovery (PITR) mechanism is used in the backup of the metering database.

When using PITR backup and restoration, the following two resource types are backed up and restored:

- Base backup

  The entire database cluster (file group in which database data is recorded) is backed up.

- WAL file

  Write-Ahead Log (WAL) files are files in which the contents of updates to the database are recorded.

Backup of the two preceding resource types is taken when the commands for the two corresponding backup methods (base backup and differential backup) are executed.

Resources that are backed up and restored using PITR are stored in the directory that has been specified in the settings file, regardless of the storage destination specified when the command was executed. Refer to "8.5 Online Backup Settings for Metering" for information on how to set this.

Each of the backup methods for performing online backup of the Management Server is described below.

Base backup

Base backup is the backup of the entire database cluster (file group in which database data is recorded).

Execute the command shown below.

Refer to "1.8.11 rcxmgrbackup" of the "Reference Guide (Resource Management) CE" for information on the command.

[Windows]

```
>Installation_folder\SVROR\Manager\bin\rcxmgrbackup -dir directory -base [-cleanup] <RETURN>
```

[Linux]

```
# /opt/FJSVrcvmr/bin/rcxmgrbackup -dir directory -base [-cleanup] <RETURN>
```

 Note
. . . .

The backup command may not end normally at times, so do not perform the following operations:

- Forced end using Ctrl+C during execution of the backup command

- Stopping the Manager during execution of the backup command

If the operations listed above have been performed, the following action will be required, depending on the status:

Execute the command shown below the next time and any subsequent times the base backup does not end normally.

When this command is executed, base backup will end normally.

Refer to Section "2.9 ctmg_resetbackuperror (Reset Base Backup Error)" of the "Reference Guide CE" for information on the command.

```
<Installation_folder>\RCXCTMG\bin\ctmg_resetbackuperror.bat
```

The processing result is output as standard output.
The contents and meaning of the processing result are shown in the table below.

Processing Result	Return Value	Message
Normal end	0	Successfully reset the base-backup error.
Error	Other than 0	Failed to reset the base-backup error.

- If starting of the Manager fails

  When operations continue after a while without the command mentioned above (ctmg_resetbackuperror) being executed, and then the Manager is stopped, subsequent starts of the Manager may fail. If this happens, an error message will be output to the database log files, as follows:

  - Database log files

  ```
  Installation_folder\RCXCTMG\Charging\log\psql-nn.log (*1)
  ```

    *1) The "nn" part is a 2-digit numeral indicating the day on which the log was output.

  - Error message

    Example: If the access control database failed to start

  ```
  LOG: could not open file "pg_xlog/xxxxxxxx" (log file 0, segment xx): No such file or directory
  (*2)
  LOG: invalid checkpoint record
  PANIC: could not locate required checkpoint record
  HINT: If you are not restoring from a backup, try removing the file
  "C:/Fujitsu/ROR/RCXCTMG/Charging/pgsql/data/backup_label".
  ```

    *2) The "xxxxxxxx" and "xx" parts of the log are undefined.

    In a case like this, delete the file shown below. When this file is deleted, start of the Manager will end normally. When this file is deleted, start of the Manager will end normally.

  ```
  Installation_folder\RCXCTMG\Charging\pgsql\data\backup_label
  ```

Differential backup

With differential backup, the contents of updates to the database are output to multiple files in 16 MB-sized lots.

These files are called Write-Ahead Logging (WAL) files.

Usually, for each 16 MB written, the WAL file being written to is switched, and the WAL file for which writing has completed is saved to the "wal" directory under the backup directory.

Execute the rcxmgrbackup command.

Periodically executing the rcxmgrbackup command allows the contents of updates to the database that are recorded in saved WAL files to be maintained for a certain period of time. For example, when the rcxmgrbackup command is executed every hour, the contents of updates performed in the most recent one-hour period will be saved.

Refer to "1.8.11 rcxmgrbackup" of the "Reference Guide (Resource Management) CE" for information on the command.

[Windows]

```
>Installation_folder\SVROR\Manager\bin\rcxmgrbackup -dir directory [-cleanup] <RETURN>
```

[Linux]

```
# /opt/FJSVrcvmr/bin/rcxmgrbackup -dir directory [-cleanup] <RETURN>
```

8.3.1 Items to be Determined Before Periodic Execution

The following items must be determined before periodic execution is implemented.

Items	What to Decide
Frequency and timing of base backup	Determine the frequency of base backup. Example: 3:00 a.m. on the 1st of every month
Frequency and timing of differential backup	Determine the frequency of differential backup. Example: Once per hour
Location of backup	Determine the location of the backup. Setting a disk other than the disk that installed the product is recommended. In addition, sufficient capacity is required to be able to store the backup file.

Refer to "8.5 Online Backup Settings for Metering" for information on how to set the backup destination.

8.3.2 Settings for Periodic Execution of Backup

The following two settings are required in order to perform periodic execution of backup:

- Setting for periodic execution of base backup

- Setting for periodic execution of WAL file save

📎 **Note**

. . . .

- If this procedure has been used to start batch files using the Task Scheduler, a command prompt is displayed while the batch files are being executed. Do not close this command prompt.

- When an error occurs at periodic execution of online backup, a message with the error code 67198 will be output to the log files. If the occurrence of errors is being monitored, use software for monitoring the log files to monitor this error message. Refer to "Message 67198" of "3.1.11 671XX" in the "Reference Guide (Resource Management) CE" for information on error messages.

. . . .

Setting for periodic execution of base backup

Specify settings so that a base backup is taken periodically.
Use Windows Task Scheduler as a mechanism for periodically executing commands. Refer to Windows Help for information on how to set the Task Scheduler.

This section describes an example of a setup procedure for implementing a backup at 3:00 a.m. on the 1st of every month.

1. From the Windows [Start] menu, select [Administrative Tools]-[Task Scheduler] to start the Task Scheduler.

2. To manage tasks hierarchically, use the following procedure to create a folder:

   a. In the Task Scheduler menu, after selecting Task Scheduler Library, select [Actions]-[New Folder], and then enter any folder name in the dialog box that is displayed and click the <OK> button.

   b. Selecting the created folder and then creating another folder by selecting [Actions]-[New Folder] from the Task Scheduler menu allows a further hierarchical level to be added.

3. From the Task Scheduler menu, select Actions >> Create Basic Task to display the Create Basic Task Wizard.

4. In the [Name] field, enter a task name (for example, "Monthly backup") and click the <Next> button.

5. Select Monthly as the task trigger and click the Next button.

6. In the Start field, set the date and time at which periodic backup is to start.
   Example: Set a date of the "1st" of the following month and "3:00:00".

7. In the Months field, select the Select all months checkbox.

8. In the Days field, Select the 1 checkbox.

9. Click the Next button.

10. Select Start a program as the task action and click the Next button.

11. Click the Browse button and in the Program/script field, set the batch files for base backup.

12. In the Add arguments (optional) field, set a character string to be used for outputting the command output to log files.

    Example: >>F:\backup\backupall.log 2>&1

13. Click the Next button.

14. Check the task settings, and if they are correct, click the <Finish> button.

Settings for periodic execution of differential backup

Specify settings so that a differential backup is taken periodically.

This section describes an example of a setup procedure for saving a differential backup every hour.

1. From the Windows [Start] menu, select [Administrative Tools]-[Task Scheduler] to start the Task Scheduler.

2. To manage tasks hierarchically, use the following procedure to create a folder:

   a. From the Task Scheduler menu, after selecting Task Scheduler Library, select [Actions]-[New Folder], and then enter a folder name in the dialog box that is displayed and click the <OK> button.

   b. Selecting the created folder and then creating another folder by selecting [Actions]-[New Folder] from the Task Scheduler menu allows a further hierarchical level to be added.

   ### P Point

   Creating a folder in Task Manager allows tasks to be managed hierarchically. In cases such as where multiple tasks are to be registered, creating a folder allows task management to be performed efficiently.

3. From the Task Scheduler menu, select [Actions]-[Create Basic Task] to display the Create Basic Task Wizard.

   ### P Point

   When a subsequent operation is performed after any folder is selected, the task will be registered under that folder. If a folder is not selected, the task will be registered in the Task Scheduler Library.

4. In the [Name] field, enter a task name (for example, "Periodic WAL switching") and click the Next button.

5. Select Daily as the task trigger and click the Next button.

6. In the Start field, set the date and time at which online backup (WAL) is to start.
   Example: Set the date of the following day and "0:00:00".

7. In the [Recur every] field, set 1 day (set by default).

8. Click the Next button.

9. Select Start a program as the task action and click the Next button.

10. Click the <Browse> button and in the [Program/script] field, set the batch files for online backup (WAL).

   ### Example

   C:\work\hourlybackup.bat

   ```
   @echo off
   echo "Resource Manager Cloud Edition Resources backup Start"
   call "{Installation_folder}\SVROR\Manager\bin\rcxmgrbackup" -dir {storage destination folder}
   echo "Resource Manager Cloud Edition Resources backup End"
   ```

   - Refer to "1.8.11 rcxmgrbackup" in the "Reference Guide (Resource Management) CE" for information on the rcxmgrbackup command.

11. In the Add arguments (optional) field, set a character string to be used for outputting the command output to log files.

   Example: >>F:\backup\backupall.log 2>&1

12. Click the Next button.

13. Check the task settings, and if they are correct, click the <Finish> button.

14. Select the registered task from the task list, and select [Action]-[Properties] to open the Properties dialog.

15. Open the Triggers tab, select the existing trigger, and click the Edit button.

16. Check the [task every:] checkbox in [Advanced settings], and select "1 hour" (set by default).

17. For the [for a duration of], select "1 day" (set by default).

18. Click the OK button.

8.4 Restoration of the Admin Server

This chapter describes how to restore resources that have been backed up.

1. Stop the manager

2. Restore the resources of the Manager

3. Start the manager

4. Update the configuration information in the operational status information

8.4.1 Stopping the Manager

Execute the command shown below to stop the Manager.

Refer to "1.7.16 rcxmgrctl" of the "Reference Guide (Resource Management) CE" for information on the command.

[Windows]

```
>Installation_folder\SVROR\Manager\bin\rcxmgrctl stop <RETURN>
```

[Linux]

```
# /opt/FJSVrcvmr/bin/rcxmgrctl stop <RETURN>
```

8.4.2 Restoring the Resources of This Product

Restore the resources of this product. Execute the command shown below.

Refer to "1.8.12 rcxmgrrestore" of the "Reference Guide (Resource Management) CE" for information on the command.

[Windows]

```
>Installation_folder\SVROR\Manager\bin\rcxmgrrestore -dir directory <RETURN>
```

[Linux]

```
# /opt/FJSVrcvmr/bin/rcxmgrrestore -dir directory <RETURN>
```

Restore image management information

If the following image management information that was saved at backup has been changed, reset it:

- Number of stored snapshot generations

[Windows]

In *value*, specify the number of stored generations that were saved at backup.

```
>Installation_folder\SVROR\Manager\bin\rcxadm imagemgr set -attr vm.snapshot.maxversion=value
<RETURN>
```

[Linux]

```
# /opt/FJSVrcvmr/bin/rcxadm imagemgr set -attr vm.snapshot.maxversion=value <RETURN>
```

Refer to "5.5 rcxadm imagemgr" of the "Command Reference" for information on the rcxadm imagemgr command.

8.4.3 Starting the Manager

Execute the command shown below to start the Manager.

Refer to "1.7.16 rcxmgrctl" of the "Reference Guide (Resource Management) CE" for information on the command.

[Windows]

```
>Installation_folder\SVROR\Manager\bin\rcxmgrctl start <RETURN>
```

[Linux]

```
# /opt/FJSVrcvmr/bin/rcxmgrctl start <RETURN>
```

8.4.4 Disabling L-Platform Applications

Disable an L-Platform application for which an application process no longer exists, if online backup of the Management Server has been performed.

Refer to Section "2.7 recoverAllService (Disable L-Platform Application)" in the "Reference Guide CE "for information on the command.

[Windows]

```
>Installation_folder\RCXCTMG\MyPortal\bin\recoverAllService.bat <RETURN>
```

[Linux]

```
# /opt/FJSVctmyp/bin/recoverAllService.sh <RETURN>
```

8.4.5 Updating the Configuration Information in the Operational Status Information

Execute the following command to update the configuration for the operational status information:

Refer to Section "5.12 cmdrefresh (Refresh Configuration Information of System Condition)" in the "Reference Guide CE "for information on the command.

[Windows]

```
>Installation folder\SWRBAM\CMDB\FJSVcmdbm\bin\cmdbrefresh.exe -a -q <RETURN>
```

[Linux]

```
# /opt/FJSVctmyp/bin/cmdbrefresh.sh -a -q <RETURN>
```

8.4.6 Work after restoration

The restored resource is reflected from the Web console by the following procedures.

1. It accesses the following URL using the browser, and logs in with the user ID "swrbaadmin".

   When installing it, "systemwalker#1" is set as for the password.

   When the password has been changed, it logs it in in the password after the change.

   ```
   http://Server Name installed Resource Orchestrator:port number/console/Default/ctmgApplication/
   ```

2. [process group] set submenu of the [system management] tab is clicked, and [DMS synchronization] are clicked by the toolbar.

   Because the process group and [synchronous from DMS: a dialog is displayed, [synchronization]

8.5 Online Backup Settings for Metering

Backup resources that use the PostgreSQL point-in-time recovery (PITR) mechanism (metering resources), which are among the resources that are obtained in online backup of the Management Server, are stored in the directory that has been specified in the settings file, regardless of the storage destination specified by the command.

This section describes how to change the backup destination directory for the online backup of metering resources.
To change the backup destination directory, the files and items in the table shown below must be changed.

File to be Changed	File Name	Item to be Changed
Operational settings file for the database	postgresql.conf	WAL save directory
Operational settings file for online backup	ctmgbackup.properties	WAL save directory
		Backup directory

Stopping the Manager

Stop the manager.

For details on how to start the manager, refer to "7.2 Starting and Stopping the Manager" of the "Setup Guide CE".

Changing the backup destination directory [Windows]

This section describes how to change the backup destination directory, based on the example shown below.

[Windows]

Directory	Type	Directory Path
Backup directory	Before change	C:\Fujitsu\ROR\RCXCTMG\backup\data
	After change	D:\basebackup
WAL save directory	Before change	C:\Fujitsu\ROR\RCXCTMG\backup\wal
	After change	E:\walbackup

[Linux]

Directory	Type	Directory Path
Backup directory	Before change	/var/opt/FJSVctchg/backup/data
	After change	/basebackup
WAL save directory	Before change	/var/opt/FJSVctchg/backup/wal
	After change	/walbackup

1. Create a new backup directory.

   [Windows]

```
> D: <RETURN>
> cd \ <RETURN>
```

```
> mkdir basebackup\Charging <RETURN>
> E: <RETURN>
> cd \ <RETURN>
> mkdir walbackup\Charging <RETURN>
```

[Linux]

```
# mkdir /basebackup <RETURN>
# mkdir /walbackup <RETURN>
```

2. Set access privileges for users connected with the database, for the directory.

[Windows]

```
>cacls D:\basebackup\Charging /T /E /G rcxctdbchg:F <RETURN>
>cacls E:\walbackup\Charging /T /E /G rcxctdbchg:F <RETURN>
```

[Linux]

```
# chown -R rcxctdbdhg:rcxctdbchg /basebackup <RETURN>
# chown -R rcxctdbdhg:rcxctdbchg /walbackup <RETURN>
```

3. Copy (move) files from the existing directory to the new directory.

[Windows]

```
>xcopy c:\Fujitsu\ROR\RCXCTMG\backup\data\* D:\basebackup\ /E /H /K /X <RETURN>
>xcopy c:\Fujitsu\ROR\RCXCTMG\backup\wal\* E:\walbackup\ /E /H /K /X <RETURN>
```

[Linux]

```
# cp -pR /var/opt/FJSVctchg/backup/data/* /basebackup/. <RETURN>
# cp -pR /var/opt/FJSVctchg/backup/wal/* /walbackup/. <RETURN>
```

4. Modify the operational settings file for the database.

Change the settings for the following operational settings file for each database cluster:

[Windows]

```
Installation_folder\RCXCTMG\Charging\pgsql\data\postgresql.conf
```

Change as follows:

- Setting before change

```
archive_command = 'copy "%p" "C:\\Fujitsu\\ROR\\RCXCTMG\\backup\\wal\\Charging\\%f"'    #
command to use to archive a logfile segment
```

- Setting after change

```
archive_command = 'copy "%p" "E:\\walbackup\\Charging\\%f"'    # command to use to archive a
logfile segment
```

P Point

Use "\\" as a delimiter.

[Linux]

```
/var/opt/FJSVctchg/pgsql/data/postgresql.conf
```

- Setting before change

```
archive_command = 'cp "%p" "/var/opt/FJSVctchg/backup/wal/%f"' # command to use to archive a
logfile segment
```

- Setting after change

```
archive_command = 'copy "%p" "E:\\walbackup\\Charging\\%f"'    # command to use to archive a
logfile segment
```

P Point
. . . .
Use "/" as a delimiter.
. . . .

5. Modify the operational settings file for the online backup.

   Open the following file:

   [Windows]

   ```
   Installation_folder\RCXCTMG\bin\conf\ctmgbackup.properties
   ```

   Change as follows:

   - Setting before change

   ```
   BASE_BACKUP_DIR=C:/Fujitsu/ROR/RCXCTMG/backup/data
   WAL_ARCHIVE_DIR=C:/Fujitsu/ROR/RCXCTMG//backup/wal
   ```

   - Setting after change

   ```
   BASE_BACKUP_DIR=D:/basebackup
   WAL_ARCHIVE_DIR=E:/walbackup
   ```

P Point
. . . .
Use "/" as a delimiter.
. . . .

   [Linux]

   ```
   /opt/FJSVctmg/bin/conf/ctmgbackup.properties
   ```

   Change as follows:

   - Setting before change

   ```
   BASE_BACKUP_DIR=/var/opt/FJSVctchg/backup/data
   WAL_ARCHIVE_DIR=/var/opt/FJSVctchg/backup/wal
   ```

   - Setting after change

   ```
   BASE_BACKUP_DIR=/basebackup
   WAL_ARCHIVE_DIR=/walbackup
   ```

P Point
. . . .
Use "/" as a delimiter.
. . . .

Start the manager

Start the manager.

Refer to "7.2 Starting and Stopping the Manager" in the "Setup Guide CE" for information on how to start the Manager.

Part 4 Monitoring by Infrastructure Administrators

Chapter 9 Monitoring Resource Pools (Dashboard)

This chapter explains how to monitor resource pools.

Use the [Dashboard] tab of the ROR console to monitor the usage status of resource pools allocated to tenants and resource pools of overall systems.

For details on the [Dashboard] tab, refer to "Chapter 3 Dashboard" of the "User's Guide for Infrastructure Administrators CE".

Chapter 10 Monitoring Resources

This chapter explains how to monitor resources.

10.1 Monitoring Servers

This section explains the monitoring of servers.

For details, refer to "Chapter 5 Monitoring" of the "Operation Guide VE".

10.2 Monitoring Networks

An infrastructure administrator recognizes an error of a network device in one of following cases.

- Report of an error from a tenant administrator or tenant user

- Detection of errors when confirming system status using the ROR console

    - The event logs to show the errors of network devices are output.

    - Status icons of resources on the network device tree are changed to a status other than normal

An infrastructure administrator checks the status of the network device and takes corrective action if the problem can be solved.

If the problem cannot be solved by the infrastructure administrator, notification of the following information is sent to the network device administrator, requesting solving of the problem.

- Network device name in which the error occurred

- Network device status

- Phenomenon noticed when receiving requests for confirmation from a tenant administrator or tenant user

10.2.1 Identification of Error Locations

This section explains how to identify the network device on which an error has occurred.

When Notified of an Error by a Tenant Administrator or Tenant User

Use the following procedure to determine the location of the problem.

1. Confirm the network device status using the ROR console.

    - If event logs showing the errors of network devices are not output.

    - If status icons of resources on the network device tree have not changed to a status other than normal

2. When there is a network device on which an error has occurred, check if the device is the network device used for an L-Platform for which notification has been received.
   When an error occurs on a network device which is not used for the L-Platform for which notification has been received, refer to "When an Error is Detected during Status Confirmation Using the ROR Console".

    - When the network device on which an error has occurred is a firewall

        a. In the orchestration tree, select the L-Platform providing services for which notification has been received from a tenant administrator or tenant user that an error has occurred.

        b. Select the [Resource List] tab of the Main Panel.

        c. Confirm "Use Resource" of "Firewall List".

        When the status of a used resource is something other than "(normal)", and the name is the same as the network device confirmed in 1. on which an error has occurred, the error will be identified as having occurred on the network device (firewall).

        Additionally, confirm the status of the specified firewall.

For details on how to confirm the status of the firewall, refer to "10.2.2 Firewall Status Confirmation".

- When the network device on which an error occurs is something other than a firewall

  a. Confirm the name of the network resource.

    The name of the network resource can be confirmed in the items of the displayed results of the rcxadm netdevice show command (AllocatedResources[Network]). Specify the name of the network device confirmed in 1. for the name of the network device name for the name option.

  b. Select the L-Platform from the orchestration tree.

  c. Select the L-Server under the L-Platform.

  d. Select the [Resource Details] tab of the Main Panel.

  e. Confirm "Network Resource" of "Network Information". When the network device name is the same as the name confirmed in a., the error on the network device (L2 switch) can be identified on the specified network device that was confirmed in a.

    Additionally, confirm the status of the specified L2 switch.

    For details on how to confirm the L2 switch status, refer to "10.2.3 L2 Switch Status Confirmation".

  When there is no network device on which an error has occurred, one of the following errors may have occurred.

- The wrong access control rules have been applied to the firewall, and passing of communication packet data is being rejected

  Use the following procedure to confirm the status of the firewall.

  a. Identify the firewall used for the notified L-Platform.

    For details on how to specify the firewall, refer to "When the network device on which an error occurs is firewall".

  b. Confirm the status of the firewall.
    For details on how to confirm the status of the firewall, refer to "10.2.2 Firewall Status Confirmation".

- An error occurred in a network device that is managed using Resource Orchestrator

  Request investigation from the network device administrator from the following point of view.

  - If an error has occurred on a network device connecting to the network device used for the L-Platform.

  - If an error has occurred on a network device on the communication route to the L-Platform

  The network device administrator must confirm the network device status, using the following procedure.

  a. Log in directly to a network device other than the L-Platform.

  b. Confirm the status of the network device.

📖 See
. . . .
- For details on the rcxadm netdevice command, refer to "1.3.6 rcxadm netdevice" in the "Reference Guide (Resource Management) CE".

- For details on the operations (such as status confirmation) for network devices, refer to the manuals of network devices.
. . . .

When an Error is Detected during Status Confirmation Using the ROR Console

When an error is detected during status confirmation using the ROR console, it can be determined that an error has occurred on the network device which has indicated an error (a firewall or an L2 switch).

- When the network device on which an error has occurred is a firewall

  Confirm the status of the firewall.
  For details on how to confirm the status of the firewall, refer to "10.2.2 Firewall Status Confirmation".

- When the network device on which an error has occurred is an L2 switch

  Check the status of the L2 switch.
  For details on how to confirm the L2 switch status, refer to "10.2.3 L2 Switch Status Confirmation".

 See
....

For details on the operations (such as status confirmation) for network devices, refer to the manuals of network devices.
....

10.2.2 Firewall Status Confirmation

This section explains the confirmation procedure of firewall status.

When an L-Platform Using a Firewall is Identified

Use the following procedure to confirm the status of the firewall.

1. In the orchestration tree, select the network device of a firewall under the L-Platform.

2. Select the [Resource Details] tab, and click the link of "Preserved resource" of "Network Device" of "Basic Information of Network Device".

   The [Resource Details] tab of the network device is displayed.

3. Confirm the displayed detailed information.

   - When there is a link of "Launch Network Device Web UI" in "Hardware Details"

     a. Click the link and start the firewall management screen.

     b. Confirm event logs or status from the started management window, and check the error detected by the firewall, such as passing of communication packets is being rejected.

   - When there is no link of "Launch Network Device Web UI" in "Hardware Details"

     Confirm the following information displayed in the Main Panel.

     Basic Information - Device Status

       The status of the firewall is displayed.
       Indicates that an error has occurred, when the status is something other than "normal".

     Port Information - Link Status

       The port status of the firewall is displayed.
       Indicates that a port error has occurred, when the status is something other than "up".

4. Confirm the status of the firewall.

   - When passing of communication packets is rejected by a firewall or an event log is output

     The infrastructure administrator must confirm if the following items using auto-configuration are correct.

     - Scripts for configurations

     - Parameter files

     - Configuration files for interfaces

   - When it is possible that the hardware has failed, in cases where the firewall device status is "unknown" or the link status is "down"

     The infrastructure administrator must request confirmation the status from the administrator of the network device, in cases where firewall hardware has not failed. The network device administrator must request a hardware maintenance person to take corrective action when hardware has failed.

5. Take corrective action based on the results of checked scripts and files.

   - When there are no errors in the scripts or files checked in 4.

     Request confirmation from a tenant administrator or tenant user that there are no errors in the parameters taken over during the L-Platform update.

   - When there are errors in the scripts or files checked in 4.

     The infrastructure administrator will log in to the firewall directly, delete the failed configuration (such as rejection of communication packets), and modify error scripts or files.

6. Take corrective action based on the results of parameter checks.

   - When there are no errors in the parameters taken over during the L-Platform update

     Confirm with the administrator of the network device that the firewall configuration has not been modified, since an unexpected definition modification may have been made.

   - When there are errors in the parameters taken over during the L-Platform update

     The infrastructure administrator will log in to the firewall directly and delete the failed configuration (such as rejection of communication packets).

7. Take corrective action based on the check results if definitions have been modified.

   - When the network device administrator has not modified the configuration

     Extract the firewall definitions and check the content. When inappropriate settings have been configured, log in to the firewall directly, and modify the definitions.

   - When a network device administrator has modified the configuration

     Check if the configuration modification is necessary.

       - When the configuration modification is not necessary

         The infrastructure administrator must log in to the firewall directly, and delete or modify the problem-causing configuration (such as rejection of communication packets).

       - When configuration modifications were necessary based on the system operation policy

         Review if the details of scripts, parameter files, and interface configuration files are based on the operation policy.

When a Firewall Error is Detected during Status Confirmation Using the ROR Console

Use the following procedure to confirm the status of the firewall.

1. Select the network device of firewall on which an error occurs from the network device tree.

2. Select the [Resource Details] tab.

3. Confirm the status of the firewall.

4. Identify the L-Platform in use.

   a. Confirm the name of the firewall allocated using auto-configuration by checking the items in displayed results of the rcxadm netdevice show command (AllocatedResources[Firewall]).

   b. Confirm the name of the L-Platform using the firewall by checking the items in displayed results of the rcxadm firewall show command (L-Platform Name). Specify the firewall name confirmed in a. as the firewall name to be specified for the name option.

5. Confirmation procedure after this, refer to the operation after step 3. of "When an L-Platform Using a Firewall is Identified".

See
• •

- For details on firewall operations (login, status confirmation, definition extraction, definition modification), refer to the manuals of firewalls.

- For details on the rcxadm netdevice command, refer to "1.3.6 rcxadm netdevice" in the "Reference Guide (Resource Management) CE".

- For details on the rcxadm firewall command, refer to "1.3.14 rcxadm firewall" in the "Reference Guide (Resource Management) CE".

10.2.3 L2 Switch Status Confirmation

This section explains the confirmation procedure of L2 switch status.

Use the following procedure to confirm the status of the L2 switch.

1. Select the network device on which the status icon has changed from normal to another using the network device tree.

2. Select the [Resource Details] tab.

3. Confirm the displayed detailed information.

   - When there is a link of "Launch Network Device Web UI" in "Hardware Details"

        a. Click the link and start the L2 switch management screen.

        b. Confirm event logs or status from the started management window, and check the error detected by the L2 switch.

   - When there is no link of "Launch Network Device Web UI" in "Hardware Details"

   Confirm the following information displayed in the Main Panel.

   ### Basic Information - Device Status

   The status of the L2 switch is displayed.
   Indicates that an error has occurred, when the status is something other than "normal".

   ### Port Information - Link Status

   The status of the port of the L2 switch is displayed.
   Indicates that a port error has occurred, when the status is something other than "up".

4. Take corrective action based on the results of L2 switch status checks.

   - When an error is detected on an L2 switch or an event log is output

   The infrastructure administrator must confirm if the specifications of configuration scripts or parameter files used in auto-configuration are correct.

   - When it is possible that the hardware has failed, in cases where the L2 switch device status is "unknown" or the link status is "down"

   The infrastructure administrator must request confirmation of the status of the L2 switch from the network device administrator. The network device administrator must request a hardware maintenance person to take corrective action when hardware has failed.

5. Take corrective action based on the results of checked scripts and files.

   - When there are no errors in the scripts or settings in files checked in 4.

   Confirm with the administrator of the network device that the L2 switch configuration has not been modified, since an unexpected definition modification may have been made.

   - When there are errors in the scripts or settings in files checked in 4.

   The infrastructure administrator will log in to the L2 switch directly, delete the failed configurations, and modify error scripts or files.

6. Take corrective action based on the check results if definitions have been modified.

   - When the network device administrator has not modified the configuration

   Extract the L2 switch definitions and check the content. When inappropriate settings have been configured, log in to the L2 switch directly, and modify the definitions.

- When a network device administrator has modified the configuration

Check that the configuration modification is necessary.

  - When the configuration modification is not necessary

  The infrastructure administrator must log in to the L2 switch directly, and delete or modify the problem-causing configuration.

  - When configuration modifications were necessary based on the system operation policy

  Review if the details of scripts and parameter files are based on the operation policy.

See

For details on L2 switch operations (login, status confirmation. definition extraction, definition modification), refer to the manuals of L2 switches.

10.2.4 Status Confirmation of Other Network Devices

This section explains the confirmation procedure for other network devices.

Use the following procedure to check the statuses of other network devices.

1. Log in to the network device directly.

2. Confirm the status using the network device functions.

See

For details on the operations (such as login and status confirmation) on the network devices, refer to the manuals of network devices.

10.3 Monitoring Storage

This section explains how to monitor storage.

The following is possible when monitoring storage.

- Display of virtual storage resource and disk resource information

- Monitoring of storage unit errors

  Use of storage management software to monitor storage.

  - For ETERNUS storage

  Refer to the "ETERNUS SF Storage Cruiser User's Guide" and the "ETERNUS SF Storage Cruiser Message Guide".

  - For EMC CLARiiON storage

  Refer to the "EMC Navisphere Manager Administrator's Guide".

  - For EMC Symmetrix DMX storage and EMC Symmetrix VMAX storage

  Refer to the "EMC Navisphere Manager Administrator's Guide".

  - For NetApp storage

  Refer to the "Data ONTAP Storage Management Guide".

Chapter 11 Monitoring L-Platforms

This chapter explains how to monitor L-Platforms.

The operation status of L-Servers can be monitored from the [Usage Condition] tab on the ROR console.

For details on the [Usage Condition] tab, refer to "Chapter 4 Usage Condition" of the "User's Guide for Infrastructure Administrators CE".

Chapter 12 Accounting

This chapter explains the accounting.

12.1 Overview

This section explains an overview of the accounting.

This function provides the basis to bill usage fee corresponding to the L-Platforms used by each tenant.

The accounting includes following functions.

Manage accounting information of L-Platform templates

Add, modify, or delete the accounting information of L-Platform templates. Based on the accounting information, usage fee (the estimated price) of L-Platform templates can be displayed on the L-Platform management window, etc. Also, the accounting information is obtained at the time of accounting calculation.
The database where the accounting information of L-Platform templates is stored is called the product master.

Note

. . . .

Usage fee (the estimated price) for the L-Platform template will be displayed provided that settings for the estimated price display function are enabled. Refer to "6.7.1 Display Function Settings for Estimated Price" for information on settings for the estimated price display function.

. . . .

Output metering logs

Output logs about virtual systems, virtual servers, and extension disks, as well as the logs for deployment, cancellation, and modification of software, and starting or stopping of virtual servers.

To calculate the accounting, calculate based on the accounting information and metering logs.

Operation image

The operation image of accounting is shown below.
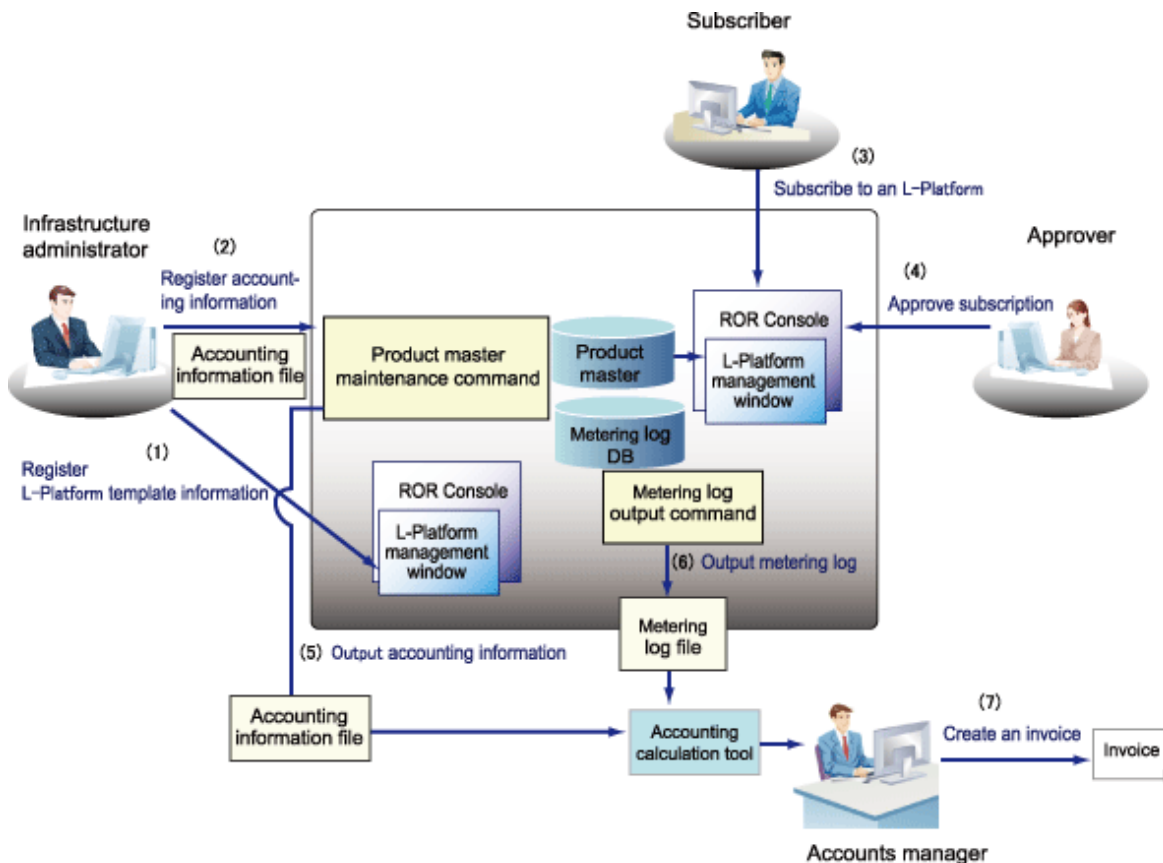
Subscriber : A tenant user or the tenant administrator who subscribes to an L-Platform

Approver : The tenant administrator specified as the forward destination when L-Platform was subscribed to

Accounts manager : A user in charge of checking the charges regularly and performs tasks such as sending an invoice to the tenat

Accounting calculation tool : Tool prepared by the infrastructure administrator or the accounts manager

[Management and operation of accounting information by the infrastructure administrator]

1. The infrastructure administrator registers L-Platform template information using the L-Platform management window of the ROR Console.

2. The infrastructure administrator registers the accounting information using the product master maintenance command. Refer to "12.3 Operate Accounting Information" for information on how to operate the accounting information.

[Operation in the tenant]

3. The subscriber references the usage fee (the estimated price) of the L-Platform templates displayed on the L-Platform management window, and subscribes to the L-Platform.

4. The approver references to the usage fee (the estimated price) of the L-Platform templates displayed in the subscription list on the ROR Console, then approves or rejects the subscription.

[Accounting calculation by the accounts manager]

5. The accounts manager obtains the accounting information file using output function of product master maintenance command.

6. The accounts manager obtains the metering log files using the output metering logs command.

7. The account manager creates billing statements based on the accounting information file and the metering log file regularly by using the accounting calculation tool provided beforehand, and sends them to the tenants.

Refer to "12.5 Accounting Calculation" for information on how to calculate the accounting.

Point
....

About the accounting calculation tool

The accounting calculation tool is a tool to calculate the amount charged to each tenant based on the accounting information file and metering log file. It is recommended to customize it so that it suits to the accounting policy, by not charging to CPUs and memories while the virtual server stops, for example. The accounting calculation tool must be prepared by the infrastructure administrator or the accounts manager.

12.2 Manage Accounting Information

This section explains how to manage the accounting information. The accounting information is managed in the product master.

The accounting information of product master is managed using the product master maintenance command. The product master maintenance command provides the following functions.

- Register the accounting information of a L-Platform template on the product master

- Output the accounting information of a L-Platform template that is registered on the product master to the accounting information file

Refer to "3.4 productmaintain (Product Master Maintenance)" in the *Reference Guide CE* for information on the product master maintenance command.

Information

Usage fee (the estimated price) of L-Platform templates will be displayed when the following operations are performed by registering the accounting information.

- L-Platform subscription from the L-Platform management window

- Modifying L-Platform templates

- Approving application list from the ROR Console

- Assessment from the ROR Console

Note

Usage fee (the estimated price) for the L-Platform template will be displayed provided that settings for the estimated price display function are enabled. Refer to "6.7.1 Display Function Settings for Estimated Price" for information on settings for the estimated price display function.

12.2.1 Information Maintained by Product Master

The accounting information can be set to the product master as products for each element type (category) that consists of the L-Platform.

The categories that can be set as products are shown below. Note that the unit prices can be specified by yearly, monthly, or hourly.

Category	Explanation
CPU	Unit price per CPU (*1).
CPU clock	Unit price per CPU clock of 0.1GHz (*1).
Memory capacity	Unit price per memory capacity of 0.1GB.
Virtual L-Server	Unit price per virtual L-Server. Set the unit price based on system disk, snapshot, and software, etc. Do not include the price for CPU, CPU clock, or memory in the specified value.
Physical L-Server	Unit price per physical L-Server. Set the unit price based on system disk, snapshot, and software, etc. Do not include the price for CPU, CPU clock, or memory in the specified value. Note that the usage fee (the estimated price) displayed on the L-Platform Management window may differ from actual price. (*2)

Category	Explanation
Data disk Capacity	Unit price per disk capacity of 0.1GB. (*3)
Template	Unit price per L-Platform template. Set the unit price based on firewall cost, network resources (network line, global IP, segment, NIC) usage cost, and system SE cost, etc. Do not include the price for virtual server or virtual disk in the specified value.

*1) The price per CPU allocated as usage fee (the estimated price) is the sum of "Unit price per CPU" and "Unit price per CPU clock * CPU clock".

Example) An example price calculation is shown below assuming following conditions.

[Conditions]

- CPU Clock: $0.10/0.1GHz

- CPU: $0.80/unit

[Example calculation]

- Price for a CPU of 3.2GHz: $0.10 * 32 + $0.80 = $4.00

- Price for two CPUs each of 1.0GHz: ($0.10 * 10 + $0.80) * 2 = $3.60

*2) When a physical L-Server is to be newly deployed, estimated price for the CPU performance and memory capacity will be calculated according to the values entered on the L-Platform Management window. The physical L-Server that is actually deployed will have performance that is closest to the value that was entered on the L-Platform Management window. Accordingly, estimated price displayed may differ to the actual price. For physical L-Servers that have already been deployed, estimated price will be calculated based on the actual CPU performance and memory capacity.

*3) Estimated price for data disk capacity are added according to disk capacity usage for each storage pool, with no differentiation between extension disks and existing disks. Note also that if the same existing disk is attached to multiple L-Servers at this time, calculations for the existing disk capacity will be added together in accordance with the number of L-Servers to which the disk is attached. Resource allocation methods differ between extension disks and existing disks. For this reason, the storage pool used for an existing disk should not be the same as one used for an extension disk. For operations that use separate storage pools, charges for the existing disk can be calculated using the following two methods:

- If charging according to the total capacity of an existing disk attached to L-Server(s):
  In the storage pool, set the amount to be charged (in units of 0.1GB) when attaching an existing disk to an L-Server. If the same existing disk is attached to multiple different L-Servers at this time, the disk capacity will be added together for the total number of attached L-Servers and charged accordingly.

- If charging by the available existing disk from the L-Platform:
  Rather than setting the price for the existing disk defined by the storage pool, perform settings instead to include the usage fee for the available existing disk in the price for the L-Platform template.

P Point
....
L-Servers and others will be allocated using the system configuration defined in the template if the L-Platform template reconfiguration is not permitted in the operation. In this case, only the prices for the templates need to be set and the prices for the L-Servers need not.
....

The usage fee (the estimated price) displayed on the L-Platform management window and others is calculated as follows.

L-Platform price

template + vertual L-Server + physical L-Server + data disk = monthly charges (approximate)

$2.00 $47.23 $101.95 $8.06 $159.00

Template

Template ID	Name	Unit price	Unit	Amount of usage Unit	Monthly price
template-1	Service1	$2.00	/month		$2.00

Virtual L-Servers

Image name	Name	Unit price	Unit	Amount of usage Unit	Monthly price
image-1	EcoServer	$0.012	/hour		$8.64

VM pool name
/VMPool-1

CPU

	Name	Unit price	Unit	Amount of usage Unit	Monthly price
CPU accounting	Xeon5110	$0.01	/hour		$7.20
Clock accounting	Xeon5110	$0.0014	/0.1GHzhour	1 GHz	$10.08
Price per CPU					$17.28
Number of CPUs				2	$34.56

Memory

	Name	Unit price	Unit	Amount of usage Unit	Monthly price
	Memory1	$0.00028	/0.1GBhour	2 GB	$4.03

Price per virtual L-Server $47.23
Number of virtual L-Servers   1 $47.23

The above calculation is repeated according to the number of virtual L-Servers.

Pyhsical L-Servers

Image name	Name	Unit price	Unit	Amount of usage Unit	Monthly price
image-2	ProServer	$0.020	/hour		$14.40

Server pool name
/ServerPool-1

CPU

	Name	Unit price	Unit	Amount of usage Unit	Monthly price
CPU accounting	XeonX7550	$0.03	/hour		$21.60
Clock accounting	XeonX7550	$0.0028	/0.1GHzhour	1 GHz	$20.16
Price per CPU					$41.76
Number of CPUs				2	$83.52

Memory

	Name	Unit price	Unit	Amount of usage Unit	Monthly price
	Memory2	$0.00028	/0.1GBhour	2 GB	$4.03

Price per pyhsical L-Server $101.95
Number of pyhsical L-Server   1 $101.95

The above calculation is repeated according to the number of pyhsical L-Servers.

Data disks

Strage pool name	Name	Unit price	Unit	Amount of usage Unit	Monthly price
/StragePool-2	RAID	$0.000056	/0.1GBhour	20 GB	$8.06

The above calculation is repeated according to the number of data disks.

```
L-Platform usage fee (the estimated price) = monthly template price + monthly price for all L-Server
                + monthly price for all data disks

  Template monthly price = template unit price * converted monthly price
  Virtual L-Server monthly price = image unit price * converted monthly converted
                +(CPU unit price * monthly converted price
                + CPU clock unit price * CPU clocks * converted monthly price) * number of CPUs
                + memory unit price * amount of memory * converted monthly price
  Physical L-Server monthly price = image unit price * converted monthly converted
                +(CPU unit price * monthly converted price
                + CPU clock unit price * CPU clocks * converted monthly price) * number of CPUs
```

```
                    + memory unit price * amount of memory * converted monthly price
    Data disk monthly price = disk unit price * amount of disk * monthly converted price
```

- If the price is hourly basis, usage fee (the estimated price) is calculated for 24 hours * 30 days.
- If the price is yearly basis, usage fee (the estimated price) is twelfth of that price.
- Usage fee (the estimated price) is rounded to nearest hundredths of dollar (cent) when displayed.

12.2.2 Accounting Information File Format

The accounting information of L-Platform templates is written to the accounting information file. The format of accounting information file is as follows.

- Character code is UTF-8.

- Each column is separated by a comma.

- Comments cannot be written.

- Character string data are enclosed by double quotations. When the double quotation is a character in a character string, enter two double quotations to escape it.

- When a double quotation is set in a character string that is enclosed with double quotations, the single double quotation will be ignored.

📋 Example

When the following string is entered in the accounting information file, the value will be "aaaaa"a".

```
"aaaaa""a"
```

When the following string is entered in the accounting information file, the value will be "aaaaaa".

```
"aaa"aaa"
```

Columns represented in an accounting information file are shown below.

No	Name	Omit	Explanation
1	Product ID	No	Specify ID that identifies the product. Register one product for each resource identifier. Specify 16 or less characters using alphanumeric characters, _(underline), or -(hyphen).
2	Priority	No	Specify the priority in a product. Multiple unit prices can be specified in a product, and the unit price with larger value has higher priority. (*1) The same priority cannot be set to the same product. Specify the numerical value from 0 to 999.
3	Start of applicable date	No	Specify start of applicable date. Format: YYYY-MM-DDThh:mm:ss.SSSZ Example) 2011-04-01T00:00:00.000+0900
4	End of applicable date	Yes	Specify end of applicable date. Format: YYYY-MM-DDThh:mm:ss.SSSZ Example) 2012-03-31T23:59:59.999+0900 Specify the date prior to the start of applicable date.
5	Category code	No	Specify the product category using following codes. - cpu: CPU - cpu clock: CPU clock - memory: memory capacity - vm: virtual L-Server

No	Name	Omit	Explanation
			- pm: physical L-Server
			- disk: extension disk capacity
			- template: template
6	Resource identifier	No	Specify information to identify the accounting target resource with 128 or less alphanumeric characters. Resource identifiers vary by the category. (*2) - cpu, cpu_clock, memory: VM pool name or sever pool name - vm: virtual L-Server image name - pm: physical L-Server image name - disk: storage pool name - template: template ID
7	Unit code	No	Specify accounting unit using following codes. - year: yearly - month: monthly - hour: hourly
8	Unit price	No	Specify unit price. Specify 11 or less digits for the integer portion and 4 or less digit for the fractional portion. Specify the fractional currency unit (ex. cent) as 1 for U.S. dollar, euro, or Singapore dollar. Specify the currency unit as 1 for Japanese yen. (*3) Example) Specify 23 if the setting value is $0.23. Specify 23 if the setting value is ¥23.
9	Product name	No	Specify the name to distinguish the products using 128 or less characters.
10	Description	Yes	Specify the description of the product using 1024 or less characters. A comma that follows the name must be entered even when the specification is omitted. Example) ...,Unit price,"Product name",

*1) An example of description is shown below assuming following settings.

- Example of the setting for product ID "ME-0001"

	Product ID	Priority	Unit price	Start of applicable date	End of applicable date
Data A	ME-0001	0	$2.00	2012-01-01T00:00:00.000+0900	None
Data B	ME-0001	1	$1.00	2012-08-01T00:00:00.000+0900	2012-08-31T23:59:59.999+0900

- The unit price for product ID "ME-0001" is $2.00 on 2011-07-01 because only data A is applied.

- The unit price for product ID "ME-0001" is $1.00 on 2011-08-15 because data B has higher priority even though both data A and data B are in the applicable period.

- An example description of accounting information file

```
"ME-0001",0,"2012-01-01T00:00:00.000+0900",,"memory","/VMPool","month",200,"Standard
memory","Standard memory"
```

```
"ME-0001",1,"2012-08-01T00:00:00.000+0900","2012-08-31T23:59:59.999+0900","memory","/
VMPool","month",100,"Standard memory(Campaign)","Standard memory(Campaign)"
```

*2) The value of the resource identifier can be obtained from the value of the corresponding XML tag of the template information list that is output in XML format by using the template information list display command. Refer to "2.13 cfmg_listtemplate (Displaying Template Information List)" in the *Reference Guide CE* for information on how to use the template information list display command.
The resource identifier for each category code and the corresponding template information (XML tag) are shown below.

- Resource identifiers and corresponding template information (XML tag)

Category code	Resource identifier	Template information (XML tag)
template	Template ID	<template><id>
vm	Virtual L-Server image name	<image><imageName>
pm	Physical L-Server image name	<image><imageName>
cpu	VM pool name or sever pool name	<server><pool>
cpu_clock	VM pool name or sever pool name	<server><pool>
memory	VM pool name or sever pool name	<server><pool>
disk	Storage pool name	<server><storagePool>

Specify VM pool name, sever pool name and storage pool name in the format that start with / (slash).
If the VM pool name, sever pool name or storage pool name are omitted, they are output to the template information as <pool /> or <storagePool />, respectively. In this case, refer to the resource pool and perform settings on the ROR Console **Resource** tab. Refer to the *User's Guide for Infrastructure Administrators (Resource Management) CE* for information on the ROR Console **Resource** tab.

*3) The currency used is determined by the currency information setting. Refer to "6.7.2 Currency Information Settings" for information on the currency information setting.

An example description of template information and corresponding accounting information is shown below.

- Example of template information

```
<?xml version="1.0" encoding="Windows-31J"?>
<templates>
    <template>
        <id>templateId1</id>
        ...
        <servers>
            <server>
                <pool>/VMHostPool</pool>
                <storagePool>/StoragePool</storagePool>
                ...
                <image>
                    <imageName>image1</imageName>
                    ...
                </image>
            </server>
        </servers>
    </template>
</templates>
```

- Example description of accounting information file

```
"TP-0001",0,"2012-01-01T00:00:00.000+0900",,"template","templateId1","month",1000,"Web/DB
Windows Server 2008 R2 Standard","Service Windows Server 2008 R2 Standard"
"VM-0001",0,"2012-01-01T00:00:00.000+0900",,"vm","image1","month",500,"Windows Server 2008 R2
```

```
Standard","VM Windows Server 2008 R2 Standard"
"CP-0001",0,"2012-01-01T00:00:00.000+0900",,"cpu","/VMHostPool","month",100,"Xeon5110","Xeon5110"
"CL-0001",0,"2012-01-01T00:00:00.000+0900",,"cpu_clock","/VMHostPool","month",
50,"Xeon5110","Xeon5110"
"ME-0001",0,"2012-01-01T00:00:00.000+0900",,"memory","/VMHostPool","month",200,"Standard
memory","Standard memory"
"DI-0001",0,"2012-01-01T00:00:00.000+0900",,"disk","/StoragePool","month",10,"normal
disk","normal disk"
```

📝 Note

- The accounting information will not be deleted from the product master automatically even after the end of applicable date. Reference to "12.3.3 Delete Accounting Information" to delete unnecessary accounting information.

- If the end of applicable date is specified, prepare other accounting information of the same product ID without specifying the end of applicable date.

- If the overcommit function is enabled, the category codes cpu_clock and memory will be calculated by default as CPU reserve performance and memory reserve capacity, respectively, and usage fee (the estimated price) will be displayed on the L-Platform Management window.
  Refer to "6.7.1 Display Function Settings for Estimated Price" for information on charge settings when the overcommit function is enabled.

12.3 Operate Accounting Information

This section explains how to operate the accounting information.
The operation for the accounting information consists of registration, modification, deleting, and reference.

Resister accounting information

Register the accounting information when newly created L-Platform templates are enabled.
The accounting information is set to the elements of L-Platform templates that are created. After finishing registration of the accounting information, enable the L-Platform templates.
It is also possible to register accounting information for L-Servers that were imported into the system using the L-Server import command.
Refer to "12.3.1 Register Accounting Information" for information on how to register the accounting information.

Modify accounting information

Modify the accounting information of the L-Platform templates that are already enabled. This corresponds to the case of setting limited time price for campaign or raising the price, for example.
The price is modified to the accounting information of the L-Platform templates registered on the product master.
It is also possible to modify accounting information for L-Servers that were imported into the system.
Refer to "12.3.2 Modify Accounting Information Command" for information on how to modify the accounting information.

Delete accounting information

Delete the accounting information if the following conditions are met.

- The L-Platform templates are disabled.

- The log that shows the usage result of the corresponding L-Platform templates does not exist in the metering log.

Refer to "12.3.3 Delete Accounting Information" for information on how to delete the accounting information.

Reference accounting information

Reference the accounting information registered on the product master when calculating the accounting. Refer to "12.3.4 Reference Accounting Information" for information on how to reference the accounting information.

12.3.1 Register Accounting Information

Methods for registering accounting information differ for L-Platform templates and L-Servers that were imported into the system.

Register Accounting Information of L-Platform template

Create new L-Platform templates, and set the accounting information to the elements of the L-Platform template that was created. After finishing the registration of the accounting information, enable the L-Platform templates.
Follow the procedure below to register the accounting information.

1. Register new L-Platform templates.
   Refer to "5.3.2 Creating New L-Platform Template" in the *User's Guide for Infrastructure Administrators CE* for information on how to register L-Platform templates.

2. Obtain a list of the template information registered.
   Refer to "2.13 cfmg_listtemplate (Displaying Template Information List)" in the *Reference Guide CE* for information on how to obtain the template information list.

3. Execute the output function of the product master maintenance command.
   The accounting information of the L-Platform templates registered on the product master will be output to the specified accounting information file by executing the output function of the product master maintenance command. Refer to "3.4 productmaintain (Product Master Maintenance)" in the *Reference Guide CE* for information on the output function of the product master maintenance command.
   This operation is unnecessary for the initial registration. Create a new accounting information file from step 4.

4. Add the accounting information of the L-Platform templates to the output accounting information file based on the template information list.
   Specify a date prior to the L-Platform template enabled date as the start of applicable date in the accounting information to be added. Omit the end of applicable date. Refer to "12.2.2 Accounting Information File Format" for information on the accounting information file format.

   Example)

	Product ID	Priority	Unit price	Start of applicable date	End of applicable date
Data A	ID001	0	$2.00	2012-01-01T00:00:00.000+0900	None

5. Notify the tenant of the contents of the newly enabled L-Platform templates (L-Platform template name, summary of the L-Platform template, usage fee (the estimated price), start of applicable date, etc.).

6. Execute the register function of the product master maintenance command.
   Specify the accounting information file updated, and execute the product master maintenance command. Refer to "3.4 productmaintain (Product Master Maintenance)" in the *Reference Guide CE* for information on the register function of the product master maintenance command.

7. Enable the L-Platform template.
   Enable the L-Platform template on the start of applicable date. Refer to "5.3.6 Publishing and Hiding L-Platform Template" in the *User's Guide for Infrastructure Administrators CE* for information on how to enable the L-Platform templates.

Registering Accounting Information for L-Servers imported into the System

Use the following procedures to import an L-Server into the system and register accounting information for the imported L-Server.

1. Use the L-Server import command to import the L-Server into the system.
   Refer to "5.3 cfmg_importlserver (Import L-Server)" in the *Reference Guide CE* for information on how to use the L-Server import command.

📑 Note

- If the <VM pool name> option is omitted when executing the L-Server import command, it will not be possible to register accounting information for the CPU, CPU clock or memory capacity.

- If the <storage pool name> option is omitted when executing the L-Server import command, it will not be possible to register accounting information for the L-Server data disk.

2. Obtain the template information list that was automatically generated by the L-Server import command. The template information list can be obtained using the template information list display command. Refer to "2.13 cfmg_listtemplate (Displaying Template Information List)" in the *Reference Guide CE* for information on how to use the template information list display command.

3.

🅿 Point
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Check the following tags to distinguish between automatically generated templates:

- Template ID (<template><id>): The template ID output when the L-Server import command is executed.

- L-Server name (<template><description>): The L-Server name specified when the L-Server import command is executed.
. . . .

4. Execute the output function of the product master maintenance command.
The accounting information of the L-Platform templates registered on the product master will be output to the specified accounting information file by executing the output function of the product master maintenance command. Refer to "3.4 productmaintain (Product Master Maintenance)" in the *Reference Guide CE* for information on the output function of the product master maintenance command.
This operation is unnecessary for the initial registration. Create a new accounting information file from step 4.

5. Add the accounting information to the output accounting information file based on the template information list.
When applying a start date for the accounting information to be added, specify a date/time prior to the date/time that the L-Server import command was executed. Omit the end of applicable date. Refer to "12.2.2 Accounting Information File Format" for information on the accounting information file format.

Example)

	Product ID	Priority	Unit price	Start of applicable date	End of applicable date
Data A	ID001	0	$2.00	2012-01-01T00:00:00.000+0900	None

6. Execute the register function of the product master maintenance command.
Specify the accounting information file updated, and execute the product master maintenance command. Refer to "3.4 productmaintain (Product Master Maintenance)" in the *Reference Guide CE* for information on the register function of the product master maintenance command.

12.3.2 Modify Accounting Information Command

Modify the accounting information of the L-Platform templates that are already enabled. This corresponds to the case of raising the price or setting limited time price for campaign.
It is also possible to modify accounting information for L-Servers imported into the system.
Follow the procedures below to modify accounting information for either L-Platform templates registered in the product master or L-Servers imported into the system.

1. Execute the output function of the product master maintenance command.
The accounting information of the L-Platform templates registered on the product master will be output to the specified accounting information file by executing the output function of the product master maintenance command. Refer to "3.4 productmaintain (Product Master Maintenance)" in the *Reference Guide CE* for information on the output function of the product master maintenance command.

2. Modify the price, or specify the time period of the output accounting information file.
An example of the modification of the accounting information file is shown below. Specify future date to the modification date.

    a. Add the modified unit price data newly to change the unit price of the product that is already registered on the product master. Example) Modify the unit price of the product whose product ID is "ID001" to $2.10 from 2012-08-01.

    Before modification:

	Product ID	Priority	Unit price	Start of applicable date	End of applicable date
Data A	ID001	0	$2.00	2012-01-01T00:00:00.000+0900	None

After modification:

	Product ID	Priori ty	Unit price	Start of applicable date	End of applicable date
Data A	ID001	0	$2.00	2012-01-01T00:00:00.000+0900	**2012-07-31T23:59:59.999+0900**
Data B	ID001	**1**	**$2.10**	**2012-08-01T00:00:00.000+0900**	**None**

     Set as follows for existing data A.
     - End of applicable date: Modify to the date just before the modification date.
     Set as follows for new data B.
     - Priority: Higher priority than the existing data A
     - Unit price: New unit price
     - Start of applicable date: Modification date
     - End of applicable date: Omit

  b. Add new data for the specific time period if a limited time price such as campaign price is to be registered.
     Example) Halve the price in the period between 2012-08-01 and 2012-08-31.

Before modification:

	Product ID	Priori ty	Unit price	Start of applicable date	End of applicable date
Data A	ID001	0	$2.00	2012-01-01T00:00:00.000+0900	None

After modification:

	Product ID	Priori ty	Unit price	Start of applicable date	End of applicable date
Data A	ID001	0	$2.00	2012-01-01T00:00:00.000+0900	None
Data B	ID001	**1**	**$1.00**	**2012-08-01T00:00:00.000+0900**	**2012-08-31T23:59:59.999+0900**

     Do not modify existing data A.
     Set as follows for new data B.
     - Priority: Higher priority than the existing data A
     - Unit price: New unit price
     - Start of applicable date: Start date of the period
     - End of applicable date: End date of the period

    Refer to "12.2.2 Accounting Information File Format" for information on the accounting information file format.

3. Notify the tenant of the contents of the modified L-Platform templates (L-Platform template name, usage fee (the estimated price), start of applicable date, etc.).

4. Execute the register function of the product master maintenance command.
Specify the accounting information file updated, and execute the product master maintenance command. Refer to "3.4 productmaintain (Product Master Maintenance)" in the *Reference Guide CE* for information on the register function of the product master maintenance command.

📌 Note

- It is necessary to stop the L-Platform management window before executing the product master maintenance command if the start of applicable date is not set to future date. Notify the tenant as such before stopping the L-Platform management window. Start the L-Platform management window after executing the register function of the product master maintenance command.

    The procedure is shown below.

    1. Execute following command to stop the L-Platform management window.

```
isstopwu RCXCT_MyPortal
```

2. Execute the product master maintenance command.

3. Execute following command to start the L-Platform management window.

```
isstartwu RCXCT_MyPortal
```

Refer to the *Interstage Application Server Reference Manual (Command Edition)* for detailed information on the isstopwu command and isstartwu command.

- The displayed price does not change for the subscription from saved specifications if the specifications are saved before modifying the price. Notify the tenant of the cautions that the price will not be the price displayed on the L-Platform management window but be the modified price after the modification date.

12.3.3 Delete Accounting Information

Delete the accounting information if the accounting calculation becomes unnecessary for the L-Platform templates or the L-Server imported into the system.
The accounting information becomes unnecessary if the following conditions are met.

- The L-Platform templates are disabled

- The log that shows the usage result of the corresponding L-Platform templates or L-Server imported into the system. does not exist in the metering log.

Follow the procedure below from disabling the L-Platform templates to deleting the accounting information.

Begin from "Check Metering Log" for L-Servers imported into the system.

Disable L-Platform templates

1. Notify to the tenant about the contents of the L-Platform templates to be disabled (L-Platform template name, usage fee (the estimated price), start of applicable date, etc.).

2. Disable the L-Platform templates on the date that was notified.
Disable the L-Platform templates using the template management window of the ROR Console. Refer to "5.3.6 Publishing and Hiding L-Platform Template" in the *User's Guide for Infrastructure Administrators CE* for information on the setting for disabling the L-Platform template.

Check Metering Log

1. Check that the log that shows the usage result of the corresponding L-Platform templates does not exist in the metering log.
Output the metering log by the output metering logs command to check that no resource identifiers corresponding to the category code of that accounting information and no information for the item ID corresponding to that exists in the metering log.

The correspondence relationships between category codes and resource identifiers in the accounting information and item IDs in the metering log are shown below.
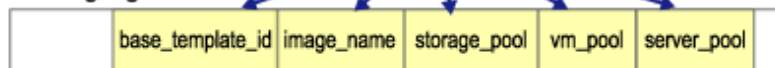
Accounting information		Metering log
Category code	Resource identifier	Item ID
cpu	VM pool name	vm_pool
	Server pool name	server_pool

Accounting information		Metering log
Category code	Resource identifier	Item ID
cpu_clock	VM pool name	vm_pool
	Server pool name	server_pool
memory	VM pool name	vm_pool
	Server pool name	server_pool
vm	Image name	image_name
pm	Image name	image_name
disk	Storage pool name	storage_pool
template	Template ID	base_template_id

Delete accounting information

1. Execute the output function of the product master maintenance command.
   The accounting information of the L-Platform templates registered on the product master will be output to the specified accounting information file by executing the output function of the product master maintenance command. Refer to "3.4 productmaintain (Product Master Maintenance)" in the *Reference Guide CE* for information on the output function of the product master maintenance command.

2. Delete accounting information that becomes unnecessary from the output accounting information file.

3. Execute the register function of the product master maintenance command.
   Specify the accounting information file updated, and execute the product master maintenance command. Refer to "3.4 productmaintain (Product Master Maintenance)" in the *Reference Guide CE* for information on the register function of the product master maintenance command.

12.3.4 Reference Accounting Information

Follow the procedure below to reference the accounting information registered on the product master.

1. Execute the output function of the product master maintenance command.
   The accounting information of the L-Platform templates registered on the product master will be output to the specified accounting information file by executing the output function of the product master maintenance command. Refer to "3.4 productmaintain (Product Master Maintenance)" in the *Reference Guide CE* for information on the output function of the product master maintenance command.

2. Reference the output accounting information file.
   Reference the accounting information file that was output by the output function of the product master maintenance command. Refer to "12.2.2 Accounting Information File Format" for information on the accounting information file format.

12.4 Metering Logs

Information based on bill calculations is saved in the database as metering logs so that fees can be charged based on the resources that have been used by tenants.

The Output metering log command is used to output metering logs to metering log files.
Refer to "3.1 ctchg_getmeterlog (Output Metering Logs)" in the *Reference Guide CE* for information on the Output metering log command.

12.4.1 Types of Metering Logs

There are two types of metering logs: event logs and periodic logs.

Each of these types of logs is explained below:

Event logs

Event logs are logs that are output when the status of a resource has changed, such as when an L-Platform is created or canceled or when an L-Server is started or stopped. An event log records resource attribute information such as the date and time at which the event occurred, event type, information for identifying the resource, and allocation amount.

The following table shows the timing at which event logs will be output:

Event	Event identifier	Timing of event	Resource
Adding	ADD	When a resource is added and when the resource is actually secured	- L-Platform - L-Server - Disk - L-Platform template (*1) - Software (*2)
Changing	CHANGE	When a resource is changed	
Deleting	DELETE	When a resource deletion is requested If an approval workflow is enabled, when an approval or assessment is performed	
Starting	START	When starting a resource is complete	- L-Server
Stopping	STOP	When stopping a resource is requested	

*1: The event log for L-Platform template is output for tenant-specific templates. The event log is not output for global templates. The CHANGE log will be output if the template name is changed. If only other basic information and configuration information are changed, the CHANGE log will not be output.

*2: The event log for software will be output based on the software information that has been registered in the image information of the L-Server. The timing of software addition or deletion events is synchronized with L-Server addition or deletion events, respectively.

Periodic logs

Periodic logs are logs that show the periodic operational status of resources.

The following table shows the timing at which periodic logs will be output:

Event	Event identifier	Timing of event	Resource
Period	PERIOD	Every day at 0:00 (default) (*1)	- L-Platform - L-Server - Disk - L-Platform template (*2) - Software

*1: If the timing of output of the periodic log is to be changed, overwrite the metering log operational settings file and then execute the Change periodic log schedule settings command.
Refer to "6.7.3 Metering Log Settings" for information on the metering log operational settings file and refer to "3.3 ctchg_chgschedule (Change Periodic Log Schedule Settings)" in the *Reference Guide CE* for the Change periodic log schedule settings command.

*2: The periodic log for L-Platform template is output for tenant-specific templates. The periodic log is not output for global templates.

📌 Note
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'Create' processing for periodic logs and 'delete' processing for metering logs are implemented periodically.
The processing results of 'create' processing for periodic logs and 'delete' processing for metering logs will be output to the following files as operation logs:

- 'Create' processing for periodic logs

  [Windows]

  ```
  <Installation directory for this product>\RCXCTMG\Charging\log\metering_period.log
  ```

[Linux]

```
/var/opt/FJSVctchg/log/metering_period.log
```

- 'Delete' processing for metering logs

[Windows]

```
<Installation directory for this product>\RCXCTMG\Charging\log\metering_log_db_delete.log
```

[Linux]

```
/var/opt/FJSVctchg/log/metering_log_db_delete.log
```

Refer to "Chapter 9 Messages Starting with meter" in the *Messages CE* to check whether processing is operating normally. Check 'create' processing for periodic logs every day at 0:00 or at least 5 minutes after the changed time. 'Delete' processing for metering logs is implemented at 0:35 every day, so check at that time or later.

12.4.2 Output Contents of Metering Logs

The contents that are output to metering logs will vary according to the resource.

The following tables show the log contents that are output in common for all resources as well as the log contents that are output for each resource:

Common

Item ID	Output for each event						Item name	Description
	ADD	CHANGE	DELETE	START	STOP	PERIOD		
version	Yes	Yes	Yes	Yes	Yes	Yes	Version	Fixed at 2.0
event_time	Yes	Yes	Yes	Yes	Yes	Yes	Time event occurred	String YYYY-MM-DDThh:mm:ss.SSSZ
event	Yes	Yes	Yes	Yes	Yes	Yes	Event	ADD: Deploy CHANGE: Change DELETE: Delete START: Start STOP: Stop PERIOD: Period
resource_type	Yes	Yes	Yes	Yes	Yes	Yes	Configured resource type	vsys: L-Platform vserver: Virtual L-Server pserver: Physical L-Server vdisk: Expansion disk template: L-Platform template software: Software

Yes: Output; No: Not output

L-Platform

In addition to the common items output, the following items will be output:

Item ID	Output for each event				Item name	Description
	ADD	CHANGE	DELETE	PERIOD		
org_id	Yes	Yes	Yes	Yes	Tenant name	ASCII: 1 to 32 characters Name of the tenant folder
user_id	Yes	Yes	Yes	Yes	User account	ASCII: 1 to 32 characters User that owns the L-Platform
vsys_id	Yes	Yes	Yes	Yes	L-Platform ID	ASCII: 1 to 32 characters ID identifying the L-Platform
system_name	Yes	Yes	No	Yes	L-Platform name	UTF-8: 1 to 256 characters Name of the L-Platform (comment)
base_template_id	Yes	Yes	No	Yes	L-Platform template ID	ASCII: 1 to 32 characters Template ID of the L-Platform creation source

Yes: Output; No: Not output

Virtual L-Server

In addition to the common items output, the following items will be output:

Item ID	Output for each event						Item name	Description
	ADD	CHANGE	DELETE	START	STOP	PERIOD		
org_id	Yes	Yes	Yes	Yes	Yes	Yes	Tenant name	ASCII: 1 to 32 characters Name of the tenant folder
user_id	Yes	Yes	Yes	Yes	Yes	Yes	User account	ASCII: 1 to 32 characters User that owns the L-Platform
vsys_id	Yes	Yes	Yes	Yes	Yes	Yes	L-Platform ID	ASCII: 1 to 32 characters ID identifying the L-Platform
server_id	Yes	Yes	Yes	Yes	Yes	Yes	L-Server ID	ASCII: 1 to 64 characters ID identifying the L-Server
system_name	Yes	Yes	No	No	No	Yes	L-Platform name	UTF-8: 1 to 256 characters Name of the L-Platform (comment)
server_name	Yes	Yes	No	No	No	Yes	L-Server name	UTF-8: 1 to 256 characters Name of the L-Server (comment)
image_name	Yes	Yes	No	Yes	Yes	Yes	Image name	ASCII: 1 to 32 characters
vm_pool	Yes	Yes	No	No	No	Yes	VM pool name	Variable-length string (unlimited)
cpu_num	Yes	Yes	No	No	No	Yes	Number of CPUs	1 to 999999
cpu_perf	Yes	Yes	No	No	No	Yes	CPU performance	1 to 999999 (Unit: 0.1 GHz) Maximum 99999.9 GHz
cpu_reserve	Yes	Yes	No	No	No	Yes	Reserve value of CPU performance	0 to 999999 (Unit: 0.1 GHz) Maximum 99999.9 GHz

Item ID	Output for each event						Item name	Description
	ADD	CHAN GE	DELET E	START	STOP	PERIO D		
memory_size	Yes	Yes	No	No	No	Yes	Memory capacity	1 to 999999 (Unit: 0.1 GB) Maximum 99999.9 GB
memory_reser ve	Yes	Yes	No	No	No	Yes	Reserve value of memory capacity	0 to 999999 (Unit: 0.1 GB) Maximum 99999.9 GB
storage_pool	Yes	Yes	No	No	No	Yes	Storage pool name	Variable-length string (unlimited)
disk_size	Yes	Yes	No	No	No	Yes	System disk size	1 to 999999 (Unit: 0.1 GB) Maximum 99999.9 GB
server_templat e_name	Yes	Yes	No	No	No	Yes	L-Server template name	ASCII: 1 to 32 characters
status	No	No	No	No	No	Yes	Status	RUNNING: Active STOPPED: Stopped

Yes: Output; No: Not output

Physical L-Server

In addition to the common items output, the following items will be output:

Item ID	Output for each event						Item name	Description
	ADD	CHAN GE	DELET E	START	STOP	PERIO D		
org_id	Yes	Yes	Yes	Yes	Yes	Yes	Tenant name	ASCII: 1 to 32 characters Name of the tenant folder
user_id	Yes	Yes	Yes	Yes	Yes	Yes	User account	ASCII: 1 to 32 characters User that owns the L-Platform
vsys_id	Yes	Yes	Yes	Yes	Yes	Yes	L-Platform ID	ASCII: 1 to 32 characters ID identifying the L-Platform
server_id	Yes	Yes	Yes	Yes	Yes	Yes	L-Server ID	ASCII: 1 to 64 characters ID identifying the L-Server
system_name	Yes	Yes	No	No	No	Yes	L-Platform name	UTF-8: 1 to 256 characters Name of the L-Platform (comment)
server_name	Yes	Yes	No	No	No	Yes	L-Server name	UTF-8: 1 to 256 characters Name of the L-Server (comment)
image_name	Yes	Yes	No	Yes	Yes	Yes	Image name	ASCII: 1 to 32 characters
server_pool	Yes	Yes	No	No	No	Yes	Server pool name	Variable-length string (unlimited)
cpu_num	Yes	Yes	No	No	No	Yes	Number of CPUs	1 to 999999
cpu_input_nu m	Yes	Yes	No	No	No	Yes	Value entered for number of CPUs	1 to 999999

Item ID	Output for each event						Item name	Description
	ADD	CHAN GE	DELET E	START	STOP	PERIO D		
cpu_perf	Yes	Yes	No	No	No	Yes	CPU performance	1 to 999999 (Unit: 0.1 GHz) Maximum 99999.9 GHz
cpu_input_per f	Yes	Yes	No	No	No	Yes	Value entered for CPU performance	1 to 999999 (Unit: 0.1 GHz) Maximum 99999.9 GHz
memory_size	Yes	Yes	No	No	No	Yes	Memory capacity	1 to 999999 (Unit: 0.1 GB) Maximum 99999.9 GB
memory_input _size	Yes	Yes	No	No	No	Yes	Value entered for memory capacity	1 to 999999 (Unit: 0.1 GB) Maximum 99999.9 GB
storage_pool	Yes	Yes	No	No	No	Yes	Storage pool name	Variable-length string (unlimited)
disk_size	Yes	Yes	No	No	No	Yes	System disk size	1 to 999999 (Unit: 0.1 GB) Maximum 99999.9 GB
server_templat e_name	Yes	Yes	No	No	No	Yes	L-Server template ID	ASCII: 1 to 32 characters
status	No	No	No	No	No	Yes	Status	RUNNING: Active STOPPED: Stopped

Yes: Output; No: Not output

Disk

In addition to the common items output, the following items will be output:

Item ID	Output for each event				Item name	Description
	ADD	CHANGE	DELETE	PERIOD		
org_id	Yes	Yes	Yes	Yes	Tenant name	ASCII: 1 to 32 characters Name of the tenant folder
user_id	Yes	Yes	Yes	Yes	User account	ASCII: 1 to 32 characters User that owns the L-Platform
vsys_id	Yes	Yes	Yes	Yes	L-Platform ID	ASCII: 1 to 32 characters ID identifying the L-Platform
server_id	Yes	Yes	Yes	Yes	L-Server ID	ASCII: 1 to 32 characters ID identifying the L-Server
disk_id	Yes	Yes	Yes	Yes	Disk ID	ASCII: 1 to 32 characters ID identifying the disk
system_name	Yes	Yes	No	Yes	L-Platform name	UTF-8: 1 to 256 characters Name of the L-Platform (comment)
disk_name	Yes	Yes	No	Yes	Disk name	UTF-8: 1 to 256 characters Name of the disk
storage_pool	Yes	Yes	No	Yes	Storage pool name	Variable-length string (unlimited)
disk_size	Yes	Yes	No	Yes	Disk size	1 to 999999 (Unit: 0.1 GB) Maximum 99999.9 GB

Yes: Output; No: Not output

L-Platform template

In addition to the common items output, the following items will be output:

Item ID	Output for each event				Item name	Description
	ADD	CHANGE	DELETE	PERIOD		
org_id	Yes	Yes	Yes	Yes	Tenant name	ASCII: 1 to 32 characters Name of the tenant folder
user_id	Yes	Yes	Yes	Yes	User account	ASCII: 1 to 32 characters User that owns the L-Platform
template_id	Yes	Yes	Yes	Yes	L-Platform template ID	ASCII: 1 to 32 characters ID identifying the L-Platform template
template_name	Yes	Yes	No	Yes	L-Platform template name	UTF-8: 1 to 256 characters Name of the L-Platform template

Yes: Output; No: Not output

Software

In addition to the common items output, the following items will be output:

Item ID	Output for each event				Item name	Description
	ADD	CHANGE	DELETE	PERIOD		
org_id	Yes	Yes	Yes	Yes	Tenant name	ASCII: 1 to 32 characters Name of the tenant folder
user_id	Yes	Yes	Yes	Yes	User account	ASCII: 1 to 32 characters User that owns the L-Platform
vsys_id	Yes	Yes	Yes	Yes	L-Platform ID	ASCII: 1 to 32 characters ID identifying the L-Platform
server_id	Yes	Yes	Yes	Yes	L-Server ID	ASCII: 1 to 32 characters ID identifying the L-Server
software_id	Yes	Yes	Yes	Yes	Software ID	ASCII: 1 to 32 characters ID identifying the software
system_name	Yes	Yes	No	Yes	L-Platform name	UTF-8: 1 to 256 characters Name of the L-Platform (comment)

Yes: Output; No: Not output

12.4.3 Formats of Metering Log Files

Metering logs are output to CSV format files or XML format files.
Use the options of the Output metering log command to specify the format in which metering logs are to be output. Refer to "3.1 ctchg_getmeterlog (Output Metering Logs)" in the *Reference Guide CE* for information on the Output metering log command.

This section explains each of the file formats.

CSV format files

The format of CSV format files is as follows:

- The item ID is output with a one-byte hash (#) sign added to the first character of the first row.

- Items are output with commas used as delimiters between each item.

- String data is output enclosed by double quotation marks and numeric data is output as it is.

- If an item is not output using string data, "" is output.

- If an item is not output using numeric data, nothing is output. (A comma is output immediately after the previous item.)

- For a Reserved item, "" is output.

The order of the items that are output to a CSV format file is as follows:

No.	Item ID	Item name	Data type
1	version	Version	Numeric
2	event_time	Time of event	String
3	Reserved		
4	vsys_id	L-Platform ID	String
5	org_id	Tenant name	String
6	event	Event	String
7	resource_type	Configured resource type	String
8	status	Status	String
9	user_id	User account	String
10	server_id	L-Server ID	String
11	disk_id	Disk ID	String
12	software_id	Software ID	String
13	system_name	L-Platform name	String
14	server_name	L-Server name	String
15	disk_name	Disk name	String
16	template_id	Template ID	String
17	Reserved		
18	base_template_id	Used template ID	String
19	image_name	Image name	String
20	storage_pool	Storage pool name	String
21	disk_size	Disk size	Numeric
22	vm_pool	VM pool name	String
23	cpu_num	Number of CPUs	Numeric
24	cpu_perf	CPU performance	Numeric
25	memory_size	Memory capacity	Numeric
26	cpu_reserve	Reserve value of CPU performance	Numeric
27	memory_reserve	Reserve value of memory capacity	Numeric
28	server_template_name	L-Server template name	String

No.	Item ID	Item name	Data type
29	server_pool	Server pool name	String
30	cpu_input_num	Value entered for number of CPUs	Numeric
31	cpu_input_perf	Value entered for CPU frequency	Numeric
32	memory_input_size	Value entered for memory capacity	Numeric
33	template_name	Template name	String

An output example of a CSV format file is shown below:

```
#version,event_time,Reserved,vsys_id,org_id,event,resource_type,status,user_id,server_id,disk_id,sof
tware_id,system_name,
server_name,disk_name,template_id,Reserved,base_template_id,image_name,storage_pool,disk_size,vm_poo
l,cpu_num,cpu_perf,
memory_size,cpu_reserve,memory_reserve,server_template_name,server_pool,cpu_input_num,cpu_input_perf
,memory_input_size,
template_name
2.0,"2011-07-02T00:00:00.000+0900","","vsysId001","orgId001","ADD","pserver","","userId001","serverI
d001","","","systemName001","ServerName001","","","","","image001","/StoragePool001",100,"",
1,3,6,,,serverTemplateName001,serverPool001,2,5,8,
2.0,"2011-08-08T10:20:10.000+0900","","","orgId001","PERIOD","template","","userId001","","","","","
","","id001","","","","",,"",,,,,,,,,,,name001
2.0,"2011-08-08T10:20:10.000+0900","","vsysId001","orgId001","PERIOD","software","","userId001","ser
verId001","","softwareId001","systemName001","","","","","","","","",,"",,,,,,,,,,,
2.0,"2011-08-08T10:20:10.000+0900","","vsysId001","orgId001","PERIOD","vserver","RUNNING","userId001
","serverId001","","","systemName001","serverName002","","","","","imageInfoName001","/
StoragePool002",100,"/VMPool001",2,30,60,10,50,serverType001,,,,,
2.0,"2011-08-08T10:20:10.000+0900","","vsysId001","orgId001","PERIOD","vdisk","","userId001","server
Id001","diskId001","","systemName001","","diskName001","","","","","/StoragePool002",
200,"",,,,,,,,,,,
2.0,"2011-08-08T10:20:10.000+0900","","vsysId001","orgId001","PERIOD","vsys","","userId001","","",""
,"systemName001","","","","","baseTemplateId001","","","",,"",,,,,,,,,,,
```

XML format files

The format of XML format files is as follows:

```
<?xml version="1.0" encoding="UTF-8"?>
<meterlog>
  <entry><Item ID>Value</Item ID>...</entry>
  <entry><Item ID>Value</Item ID>...</entry>
  ...
</meterlog>
```

- The first row of the CSV format corresponds to the <entry> element.

- The first column of the CSV format corresponds to the <Item ID> element.

- If an item is not output, the <Item ID> tag itself is not output.

An output example of an XML format file is shown below:

```
<?xml version="1.0" encoding="UTF-8"?>
<meterlog>
    <entry>
        <version>2.0</version>
        <event_time>2011-07-02T00:00:00.000+0900</event_time>
        <vsys_id>vsysId001</vsys_id>
        <org_id>orgId001</org_id>
```

```
            <event>ADD</event>
            <resource_type>pserver</resource_type>
            <user_id>userId001</user_id>
            <server_id>serverId001</server_id>
            <system_name>systemName001</system_name>
            <server_name>serverName001</server_name>
            <image_name>image001</image_name>
            <storage_pool>storagePool001</storage_pool>
            <disk_size>1</disk_size>
            <cpu_num>1</cpu_num>
            <cpu_perf>3</cpu_perf>
            <memory_size>6</memory_size>
            <server_template_name>serverTemplateName001</server_template_name>
            <server_pool>serverPool001</server_pool>
            <cpu_input_num>2</cpu_input_num>
            <cpu_input_perf>5</cpu_input_perf>
            <memory_input_size>8</memory_input_size>
        </entry>
        <entry>
            ...
        </entry>
        ...
</meterlog>
```

P Point

- If a change of tenant has been performed for an L-Platform, an event log with CHANGE as the event will be output.

- If snapshot restore has been performed, an event log with CHANGE as the event will be output even if there was no change.

- At execution of the Import L-Server command of the L-Platform Management function, the following event log will be output:

    - If a stopped L-Server has been imported
      Event log with ADD as the event

    - If an active L-Server has been imported
      Event log with ADD and START as the events

Note

- An event indicating a stop of an L-Server (STOP) occurs for a stop or a forced stop of an L-Server. The forced stop of an L-Server can be performed even if the L-Server has a stopped status (STOPPED). Therefore, take into account that even if an L-Server has a stopped status, an event indicating a stop of the L-Server (STOP) may exist.

- When starting virtual L-Servers using RHEL-KVM as virtualization software, the amount of memory used by L-Servers is set to the upper limit first, and then it is reduced to the value specified to L-Servers by the RHEL-KVM management application. Therefore metering logs will be output in the following order if a RHEL-KVM L-Server is started.

    1. L-Server starting (START)

    2. L-Server changing (CHANGE) : Memory capacity = The upper limit

    3. L-Server changing (CHANGE) : The upper limit > Memory capacity > The value specified to the L-Server (*)

    4. L-Server changing (CHANGE) : Memory capacity = The value specified to the L-Server

    *) The changing log 3. may not be output sometimes.

    Refer to "Overcommit" in "E.6.4 Setup" in the *Setup Guide CE* for the RHEL-KVM memory amount.

12.4.4 Deleting Metering Logs

Metering logs are periodically deleted from the database.

Delete processing is implemented every day at 0:35 and the logs for which the log entry retention period that was set in the metering operational settings file has passed will be deleted.
When metering logs are deleted, billing can no longer be calculated, so set the log entry retention period so that only the metering logs for which billing calculations are complete will be deleted.

Refer to "6.7.3 Metering Log Settings" for information on the metering log operational settings file.

12.5 Accounting Calculation

This section explains how to calculate the accounting.

The account manager calculate the amount of accounting based on the accounting information file and the metering log file, and send the calculated billing statement for each tenant.

The basic flow to calculate the accounting is shown below.

1. Use the product master maintenance command to output the accounting information file.
   Refer to "3.4 productmaintain (Product Master Maintenance)" in the *Reference Guide CE* for information on the product master maintenance command.

2. Use the output metering logs command to output the periodic log of the start date of the accounting calculation, and event log for the period of calculation (i.e., from the start date of the accounting calculation to the end date of the accounting calculation).
   Refer to "3.1 ctchg_getmeterlog (Output Metering Logs)" in the *Reference Guide CE* for information on the Output metering log command.

3. Sort the metering log in the order of virtual system (vsys_id) and the event occurrence time (event_time).

4. Extract the contents of the periodic log as the accounting target products for each virtual system.

5. Reference the metering log in the order of time for each virtual system. Calculate the accounting for the accounting target products for the duration between the time of occurrence of an event and the time of the previous event (or the time of the periodic log if the event is the first one).
   Perform following calculations for all of the accounting target products, and sum up the amount.

   Unit price of the product * Unit amount (amount of usage per unit code) * Quantity

   The correspondence relationship between the accounting information and the metering log is shown below.

Accounting information		Metering log		
Category code	Category code	Component resource type (resource_type)	Item ID	Item ID of quantity
cpu	VM pool name	vserver	vm_pool	cpu_num
	Server pool name	pserver	server_pool	cpu_num
cpu_clock	VM pool name	vserver	vm_pool	cpu_perf
	Server pool name	pserver	server_pool	cpu_perf
memory	VM pool name	vserver	vm_pool	memory_size
	Server pool name	pserver	server_pool	memory_size
vm	Image name	vserver	image_name	-
pm	Image name	pserver	image_name	-
disk	Storage pool name	vdisk	storage_pool	disk_size
template	Template ID	vsys	base_template_id	-

6. Modify the status of the accounting target product according to the occurred event. For example, delete it from the accounting target products if the event is cancellation (DELETE).

7. Repeat the steps 5 and 6 until the end data of the accounting calculation.

8. Repeat the steps 4 through 7 for each virtual system.

Note

....

- Do not include the software and system disk in the accounting calculation target because they do not exist in the accounting information.

- In the case where the accounting information was modified within the accounting target period, clarify how to handle the accounting calculation after the applicable date before performing accounting calculation.

- The log that shows the tenant that own the system has been changed is output as the event log (CHANGE) when the management source tenant have been changed by the change management source for the L-Platform. Change the tenant to be charged if this accounting event is detected.

....

12.5.1 Example Accounting Calculation

An example of accounting calculation is shown below.

[Conditions]

- The cutoff date is the end of month (0:00 on 1st)

- Perform the accounting calculation for April, 2012.

- The cpu, cpu_clock, and memory are charged hourly, and the template, vm, and disk are charged monthly.

- The products charged hourly are charged while the virtual server is running (the hour is rounded up).

- The products charged monthly are charged if they are deployed even just one time in the mouth.

1. Use the product master maintenance command to output the accounting information file.

    [Windows]

    ```
    productmaintain.bat export c:\chargeinfofile
    ```

    [Linux]

    ```
    productmaintain.sh export /tmp/chargeinfofile
    ```

    An example of the output accounting information log is shown below.

Product ID	Priority	Category code	Resource identifier	Unit code	Unit price
T001	0	template	TE 01	month	$2.00
S001	0	vm	IM 01	month	$1.00
C001	0	cpu	/VMPool	hour	$0.001
P001	0	cpu_clock	/VMPool	hour	$0.002
M001	0	memory	/VMPool	hour	$0.001
D001	0	disk	/StragePool	month	$0.05

2. Use the output metering logs command to output the periodic log of the start date of the accounting calculation and event log for the period of calculation.

    [Windows]

    ```
    ctchg_getmeterlog.bat -start 2012-04-01 -end 2012-04-01 -period -outputfile periodfile
        (Output the periodic log of April 1, 2012)
    ctchg_getmeterlog.bat -start 2012-04-01 -end 2012-04-30 -event -outputfile eventfile
        (Output the event log of April, 2012)
    ```

    [Linux]

    ```
    ctchg_getmeterlog.sh -start 2012-04-01 -end 2012-04-01 -period -outputfile periodfile
        (Output the periodic log of April 1, 2012)
    ```

```
ctchg_getmeterlog.sh -start 2012-04-01 -end 2012-04-30 -event -outputfile eventfile
      (Output the event log of April, 2012)
```

An example of the output metering log is shown below.
No.1 to 3 is the periodic log, and the No.4 to 14 is the event log.

No.	event_time	vsys_id	event	resource_type	status	server_id	disk_id	software_id	base_template_id	image_name	storage_pool	disk_size	vm_pool	cpu_num	cpu_perf	memory_size
1	2012-04-01T00:00:00	VSYS01	PERIOD	software		S-0001		SW-01								
2	2012-04-01T00:00:00	VSYS01	PERIOD	vserver	STOPPED	S-0001				IM_01	/StoragePool	150	/VMPool	1	10	10
3	2012-04-01T00:00:00	VSYS01	PERIOD	vsys					TE_01							
4	2012-04-01T09:00:00	VSYS01	START	vserver		S-0001				IM_01						
5	2012-04-30T13:00:00	VSYS02	ADD	vserver		S-0002				IM_01	/StoragePool	150	/VMPool	1	10	15
6	2012-04-30T13:00:00	VSYS02	ADD	vsys					TE_01							
7	2012-04-30T13:00:00	VSYS02	ADD	vdisk		S-0002	D-0001				/StoragePool	100				
8	2012-04-30T13:00:00	VSYS02	ADD	software		S-0002		SW-01								
9	2012-04-30T13:10:00	VSYS02	START	vserver		S-0002				IM_01						
10	2012-04-30T18:00:00	VSYS02	STOP	vserver		S-0002				IM_01						
11	2012-04-30T19:00:00	VSYS02	DELETE	vdisk		S-0002	D-0001									
12	2012-04-30T19:00:00	VSYS02	DELETE	vserver		S-0002										
13	2012-04-30T19:00:00	VSYS02	DELETE	vsys												
14	2012-04-30T19:00:00	VSYS02	DELETE	software		S-0002		SW-01								

3. Sort the metering log in the order of virtual system (vsys_id) and the event occurrence time (event_time).
   Perform the accounting calculation for the row where the virtual system id = VSYS01. (The target metering logs are No.1 to 4.)

4. Extract the contents of the periodic log as the accounting target products for each virtual system.
   Extract the periodic log of No.1 to 3. Do not include the software (the log where resource_type=software) and the system disk (the value of disk_size in the log where resource_type=vserver) in the accounting calculation target.

vsys_id	server_id	Category code	Resource identifier	Quantity	status
VSYS01	S-0001	cpu	/VMPool	1	STOPPED
VSYS01	S-0001	cpu_clock	/VMPool	10	STOPPED
VSYS01	S-0001	memory	/VMPool	10	STOPPED
VSYS01	S-0001	vm	IM_01	1	STOPPED
VSYS01		template	TE_01	1	

(Extraction time: April 1 0:00:00)

5. Check the metering log in the order of time for each virtual system to calculate the accounting for the accounting target products for the duration between the event log of the event No.4 and 3.

vsys_id	server_id	Category code	Resource identifier	Quantity	status	Unit code	Unit price	Unit amount	Subtotal	Monthly charges
VSYS01	S-0001	cpu	/VMPool	1	STOPPED	hour	$0.001	0		
VSYS01	S-0001	cpu_clock	/VMPool	10	STOPPED	hour	$0.002	0		
VSYS01	S-0001	memory	/VMPool	10	STOPPED	hour	$0.001	0		
VSYS01	S-0001	vm	IM_01	1	STOPPED	month	$1.000	1	$1.000	
VSYS01		template	TE_01	1		month	$2.000	1	$2.000	
								Total	$3.000	

(Extraction time: April 1 9:00:00)

Calculate only the monthly charge for the duration between the event No.3 and 4 because the virtual server was stopped.
Perform the following calculation for each accounting target product, and sum up the amount.
Unit price of the product * Unit amount (1 because it is monthly) * Quantity

6. Modify the status of the accounting target product according to the event No.4.
   Mark the monthly charges with "Complete", and modify the status to running (RUNNING) because the event No.4 is START.

vsys_id	server_id	Category code	Resource identifier	Quantity	status	Unit code	Unit price	Unit amount	Subtotal	Monthly charges
VSYS01	S-0001	cpu	/VMPool	1	RUNNING	hour	$0.001			
VSYS01	S-0001	cpu_clock	/VMPool	10	RUNNING	hour	$0.002			
VSYS01	S-0001	memory	/VMPool	10	RUNNING	hour	$0.001			
VSYS01	S-0001	vm	IM_01	1	RUNNING	month	$1.000			Complete
VSYS01		template	TE_01	1		month	$2.000			Complete

7. Repeat the operation of step 5 and 6 until the end date of the accounting calculation. Calculate as follows because there are no events until the end date of the accounting calculation.

vsys_id	server_id	Category code	Resource identifier	Quantity	status	Unit code	Unit price	Unit amount	Subtotal	Monthly charges
VSYS01	S-0001	cpu	/VMPool	1	RUNNING	hour	$0.001	711	$0.711	
VSYS01	S-0001	cpu_clock	/VMPool	10	RUNNING	hour	$0.002	711	$14.220	
VSYS01	S-0001	memory	/VMPool	10	RUNNING	hour	$0.001	711	$7.110	
VSYS01	S-0001	vm	IM_01	1	RUNNING	month	$1.000			Complete
VSYS01		template	TE_01	1		month	$2.000			Complete
								Total	$22.041	

Calculate the hourly charges for the duration between the event No.4 and the end date of the accounting calculation (711 hours from 9:00:00 April 1 to 23:59:59 April 30) because the virtual server was running (RUNNING) for that duration. Perform the following calculate for each accounting target product, and sum up the amount.
Unit price of the product * Unit amount (711 because it is hourly) * Quantity

8. The amount for VSYS01 is as follows.
$3.00 + $22.04 = $25.04

9. Calculate the accounting for virtual system (VSYS02). (The target metering log is from the event No.5 to 14).
Extract the accounting target products from the event No.5 to 8 because no periodic log exists for VSYS02.
Do not include the software (the log where resource_type=software) and system disk (the value of disk_size in the log where resource_type=vserver) in the target.

vsys id	server id	disk id	Category code	Resource identifier	Quantity	status
VSYS02	S-0002		cpu	/VMPool	1	STOPPED
VSYS02	S-0002		cpu clock	/VMPool	10	STOPPED
VSYS02	S-0002		memory	/VMPool	15	STOPPED
VSYS02	S-0002	D-0001	disk	/StoragePool	100	STOPPED
VSYS02	S-0002		vm	IM 01	1	STOPPED
VSYS02			template	TE 01	1	

(Extraction time: April 30 13:00:00)

10. Check the metering log in the order of time to calculate the accounting for the accounting target products for the duration between the event No.9 and 8.

vsys_id	server_id	disk_id	Category code	Resource identifier	Quantity	status	Unit code	Unit price	Unit amount	Subtotal	Monthly charges
VSYS02	S-0002		cpu	/VMPool	1	STOPPED	hour	$0.001	0		
VSYS02	S-0002		cpu_clock	/VMPool	10	STOPPED	hour	$0.002	0		
VSYS02	S-0002		memory	/VMPool	15	STOPPED	hour	$0.001	0		
VSYS02	S-0002	D-0001	disk	/StoragePool	100	STOPPED	month	$0.050	1	$5.000	
VSYS02	S-0002		vm	IM 01	1	STOPPED	month	$1.000	1	$1.000	
VSYS02			template	TE 01	1		month	$2.000	1	$2.000	
									Total	$8.000	

(Extraction time: April 30 13:10:00)

Calculate only the monthly charges for the duration between the event No.8 and 9 because the virtual server was stopped.
Perform the following calculation for all of the accounting target products, and sum up the amount.
Unit price of the product * Unit amount (1 because it is monthly) * Quantity

11. Modify the status of the accounting target product according to the event No.9.
Mark the monthly charges with "Complete", and modify the status to running (RUNNING) because the event No.9 is START.

vsys_id	server_id	disk_id	Category code	Resource identifier	Quantity	status	Unit code	Unit price	Unit amount	Subtotal	Monthly charges
VSYS02	S-0002		cpu	/VMPool	1	RUNNING	hour	$0.001			
VSYS02	S-0002		cpu_clock	/VMPool	10	RUNNING	hour	$0.002			
VSYS02	S-0002		memory	/VMPool	15	RUNNING	hour	$0.001			
VSYS02	S-0002	D-0001	disk	/StoragePool	100	RUNNING	month	$0.050			Complete
VSYS02	S-0002		vm	IM 01	1	RUNNING	month	$1.000			Complete
VSYS02			template	TE 01	1		month	$2.000			Complete

12. Calculate the accounting for the accounting target products for the duration between the event No.10 and 9.

vsys_id	server_id	disk_id	Category code	Resource identifier	Quantity	status	Unit code	Unit price	Unit amount	Subtotal	Monthly charges
VSYS02	S-0002		cpu	/VMPool	1	RUNNING	hour	$0.001	5	$0.005	
VSYS02	S-0002		cpu_clock	/VMPool	10	RUNNING	hour	$0.002	5	$0.100	
VSYS02	S-0002		memory	/VMPool	15	RUNNING	hour	$0.001	5	$0.075	
VSYS02	S-0002	D-0001	disk	/StoragePool	100	RUNNING	month	$0.050			Complete
VSYS02	S-0002		vm	IM 01	1	RUNNING	month	$1.000			Complete
VSYS02			template	TE 01	1		month	$2.000			Complete
									Total	$0.180	

(Extraction time: April 30 18:00:00)

Calculate the hourly charges for the duration between the event No.9 and 10 (5 hours from 13:10:00 April 30 to 18:00:00 April 30) because the virtual server was running (RUNNING) for that duration.
Perform the following calculation for all of the accounting target products, and sum up the amount.
Unit price of the product * Unit amount (5 because it is hourly) * Quantity

13. Modify the status of the accounting target product according to the event No.10.
Modify the status to be stopped (STOPPED) because the event No.10 is STOP.

vsys_id	server_id	disk_id	Category code	Resource identifier	Quantity	status	Unit code	Unit price	Unit amount	Subtotal	Monthly charges
VSYS02	S-0002		cpu	/VMPool	1	STOPPED	hour	$0.001			
VSYS02	S-0002		cpu_clock	/VMPool	10	STOPPED	hour	$0.002			
VSYS02	S-0002		memory	/VMPool	15	STOPPED	hour	$0.001			
VSYS02	S-0002	D-0001	disk	/StoragePool	100	STOPPED	month	$0.050			Complete
VSYS02	S-0002		vm	IM_01	1	STOPPED	month	$1.000			Complete
VSYS02			template	TE_01	1		month	$2.000			Complete

14. Calculate the accounting for the accounting target products for the duration between the event No.11 and 10. This time, there is nothing to be charged.

vsys_id	server_id	disk_id	Category code	Resource identifier	Quantity	status	Unit code	Unit price	Unit amount	Subtotal	Monthly charges
VSYS02	S-0002		cpu	/VMPool	1	STOPPED	hour	$0.001			
VSYS02	S-0002		cpu_clock	/VMPool	10	STOPPED	hour	$0.002			
VSYS02	S-0002		memory	/VMPool	15	STOPPED	hour	$0.001			
VSYS02	S-0002	D-0001	disk	/StoragePool	100	STOPPED	month	$0.050			Complete
VSYS02	S-0002		vm	IM_01	1	STOPPED	month	$1.000			Complete
VSYS02			template	TE_01	1		month	$2.000			Complete
									Total		

(Extraction time: April 30 19:00:00)

15. Modify the status of the accounting target product according to the event No.11.
Delete the accounting target product because the event No.11 is DELETE. The total amount for VSYS02 is as follows because there are no events until the end date of the accounting calculation.

$8.00 + $0.18 = $8.18

16. Sum up the amount of VSYS01 and VSYS02 for each tenant, and issue the billing statements.

Chapter 13 Monitoring Logs

This chapter explains how to monitor logs.

13.1 Operation Logs

This section explains the operation logs of Resource Orchestrator.

> 📁 **Note**
> . . . .
>
> - Operation logs should be used by only infrastructure administrators or administrators, as all user operations of Resource Orchestrator can be viewed.
>
> - Displaying resource names arranged in hierarchies is not supported.
> . . . .

13.1.1 Overview

Provides the functions to record user operations as operation logs in Resource Orchestrator.

Using this function, administrators can monitor the following information:

- Time events were recorded in the operation logs

- User ID

- User group name

- IP address

- Status

- Resource name

- Operations

> 📁 **Note**
> . . . .
>
> Audit and billing functions are not provided in Resource Orchestrator.
> . . . .

The operation logs are output in the following formats:

```
Date   User  Group   IP           Progress  Resource  Event
-----  -----  ------  -----------  ---------  ---------  -------
```

Element Name	Description	Remarks
Date	Time events were recorded in the operation logs	The time events recorded in the operation logs are output in the local time. If daylight savings time (a regulation of time in summer) is set on the operating system, the time events are output in daylight savings time. Time events are output in the following format: YYYY-MM-DD HH:MM:SS.XXX
User	User ID	The user ID of the logged in user is output. When a special administrator uses the command, a hyphen ("-") is output.
Group	User group name	The name of the user group name the logged in user belongs to is output. When the logged in user does not belong to a user group, a hyphen ("-") is output.
IP	IP address	The IP addresses of the connected clients are output.

Element Name	Description	Remarks

Progress	Status	Starting and stopping of operations, and errors are output. The following statuses are output:
		
		- Start of operations
		
		  Starting(*Operation_identifier*)
		
		- End of operations
		
		  Completed(*Operation_identifier*)
		
		- Errors during operations
		
		  Error(*Operation_identifier*)

Resource	Resource name	A resource name and a resource identifier are output in the following format: - "Resource identifier(*Resource_name*)"
Event	Operations	The parameters received by the manager are output. For the information that will be output, refer to "13.1.4 Scope of Operations Recorded in Operation Logs".

Note

- A hyphen ("-") may be output for an operation identifier.

- For operations involving multiple resources, the same resource name as the one displayed in the Recent Operations on the ROR console and the event log is output in "Resource".

Example

Output the latest 1 day's worth of data.

For details on how to operate operation logs, refer to "1.7.15 rcxadm logctl", and for the information to be output, refer to "13.1.4 Scope of Operations Recorded in Operation Logs" of the "Reference Guide (Resource Management) CE)".

```
>rcxadm logctl list -latest -duration 1D <RETURN>
Date                    User   Group  IP              Progress               Resource                Event
----------------------  -----  ------ --------------  ---------------------  -----------------------
--------------------
2011-03-10 21:15:00.390 -      -      10.20.30.53     Starting(BX620-1_21)   BX620-1_473(snap)
l_servers create
2011-03-10 21:15:06.250 -      -      10.20.30.53     Error(BX620-1_21)      BX620-1_473(snap)
l_servers create
2011-03-10 21:26:05.953 -      -      10.20.30.73     Starting(BX620-1_25)   BX620-1_510(snap)
l_servers create
2011-03-10 21:29:21.150 -      -      10.20.30.73     Completed(BX620-1_25)  BX620-1_510(snap)
l_servers create
2011-03-10 23:15:39.750 admin  -      10.20.30.53     Starting(BX620-1_35)   BX620-1_510(snap)
server_images snapshot
2011-03-10 23:15:46.781 admin  -      10.20.30.53     Completed(BX620-1_35)  BX620-1_510(snap)
server_images snapshot
2011-03-10 23:16:23.625 admin  -      10.20.30.53     Starting(BX620-1_36)   BX620-1_510(snap)
server_images restore
2011-03-10 23:16:28.484 admin  -      10.20.30.53     Completed(BX620-1_36)  BX620-1_510(snap)
server_images restore
2011-03-10 23:17:00.859 admin  -      10.20.30.53     Starting(BX620-1_37)   BX620-1_510(snap)
server_images destroy
2011-03-10 23:17:04.718 admin  -      10.20.30.53     Completed(BX620-1_37)  BX620-1_510(snap)
server_images destroy
```

```
2011-03-10 23:19:25.734  admin   -       10.20.30.53     Starting(BX620-1_38)    BX620-1_744(image_test)
server_images create
2011-03-10 23:27:29.640  admin   -       10.20.30.53     Completed(BX620-1_38)   BX620-1_744(image_test)
server_images create
2011-03-10 23:42:37.171  admin   -       10.20.30.53     Starting(BX620-1_40)    BX620-1_578(image_test)
server_images destroy
2011-03-10 23:42:47.460  admin   -       10.20.30.53     Completed(BX620-1_40)   BX620-1_578(image_test)
server_images destroy
2011-03-10 23:51:06.620  userA   groupA  127.0.0.1       Starting(BX620-1_41)    BX620-1_806(LS_RT_A001)
l_servers create
2011-03-10 23:53:06.437  userA   groupA  127.0.0.1       Completed(BX620-1_41)   BX620-1_806(LS_RT_A001)
l_servers create
2011-03-10 23:53:39.265  userA   groupA  127.0.0.1       Starting(BX620-1_42)    BX620-1_806(LS_RT_A001)
l_servers start
2011-03-10 23:54:26.640  userA   groupA  127.0.0.1       Completed(BX620-1_42)   BX620-1_806(LS_RT_A001)
l_servers start
2011-03-10 23:54:45.531  userA   groupA  127.0.0.1       Starting(BX620-1_43)    BX620-1_806(LS_RT_A001)
l_servers restart
2011-03-10 23:55:26.859  userA   groupA  127.0.0.1       Completed(BX620-1_43)   BX620-1_806(LS_RT_A001)
l_servers restart
2011-03-10 23:55:48.953  userA   groupA  127.0.0.1       Starting(BX620-1_44)    BX620-1_806(LS_RT_A001)
l_servers stop
2011-03-10 23:56:26.390  userA   groupA  127.0.0.1       Completed(BX620-1_44)   BX620-1_806(LS_RT_A001)
l_servers stop
2011-03-10 23:57:11.968  userA   groupA  127.0.0.1       Starting(BX620-1_46)    BX620-1_806(LS_RT_A001)
l_servers attach
2011-03-10 23:58:21.359  userA   groupA  127.0.0.1       Completed(BX620-1_46)   BX620-1_806(LS_RT_A001)
l_servers attach
2011-03-10 23:58:35.620  userA   groupA  127.0.0.1       Starting(BX620-1_47)    BX620-1_806(LS_RT_A001)
l_servers detach
2011-03-10 23:59:23.343  userA   groupA  127.0.0.1       Completed(BX620-1_47)   BX620-1_806(LS_RT_A001)
l_servers detach
2011-03-10 23:59:40.265  userA   groupA  127.0.0.1       Starting(BX620-1_48)    BX620-1_806(LS_RT_A001)
l_servers migrate
2011-03-11 00:00:53.984  userA   groupA  127.0.0.1       Completed(BX620-1_48)   BX620-1_806(LS_RT_A001)
l_servers migrate
2011-03-11 00:01:09.296  userA   groupA  127.0.0.1       Starting(BX620-1_50)    BX620-1_806(LS_RT_A001)
l_servers update
2011-03-11 00:02:58.125  userA   groupA  127.0.0.1       Completed(BX620-1_50)   BX620-1_806(LS_RT_A001)
l_servers update
2011-03-11 00:04:42.640  userA   groupA  127.0.0.1       Starting(BX620-1_57)    BX620-1_806(LS_RT_A001)
l_servers destroy
2011-03-11 00:05:22.921  userA   groupA  127.0.0.1       Completed(BX620-1_57)   BX620-1_806(LS_RT_A001)
l_servers destroy
2011-03-11 00:35:44.250  userA   groupA  127.0.0.1       Starting(BX620-1_117)   BX620-1_954(LS_RT_A001)
folders move_resource
2011-03-11 00:35:44.625  userA   groupA  127.0.0.1       Completed(BX620-1_117)  BX620-1_954(LS_RT_A001)
folders move_resource
2011-03-11 01:04:34.880  admin   -       10.20.30.53     Starting(BX620-1_570)   BX620-1_2193(master-52)
l_servers convert
2011-03-11 01:04:36.650  admin   -       10.20.30.53     Completed(BX620-1_570)  BX620-1_2193(master-52)
l_servers convert
2011-03-11 01:05:05.568  admin   -       10.20.30.53     Starting(BX620-1_571)   BX620-1_2193(master-52)
l_servers revert
2011-03-11 01:05:06.451  admin   -       10.20.30.53     Completed(BX620-1_571)  BX620-1_2193(master-52)
l_servers revert
```

> 📌 **Note**
> ....
>
> The starting point (Starting) of recording for each operation is when the operation is displayed in the Recent Operations on the ROR console.
>
> ....

13.1.2 Usage Method

This section explains the methods for configuring and operating operation logs.

Perform the following procedure:

1. Disk space estimation

   Infrastructure administrator (infra_admin) estimates the disk size to use for storing operation logs.

   Estimate the amount of disk space using the following formula, and then decide the number of days to retain operation logs.

{(*Number_of_operations_of_the_resource_in_1_day*) * (*Number_of_target_resources*) * 1(KB)} * (*retention_period*)

   > 💡 **Example**
   > ....
   >
   > Disk space when estimating that the retention period is 180 days (by default), the target resource is operated 4 times, and the number of target resources is 256
   >
   > | Retention period | Necessary Disk Space | Formula |
   > |---|---|---|
   > | 180 days worth | Approx. 185 MB | 4 * 256 * 1 * 180 = 184320 (KB) |
   >
   > ....

2. Check the settings in the [Date and Time properties] dialog of the operating system

   Check whether the following tabs of the OS are configured correctly. If the settings are incorrect, set them correctly.

   - [Date and Time] tab

   - [Time Zone] tab

   - [Internet Time(or the Network Time Protocol)] tab

3. Configure the retention period of operation logs

   Execute the rcxadm logctl set command, to configure the retention period for operation logs.
   For details on the rcxadm logctl set command, refer to "1.7.15 rcxadm logctl" in the "Reference Guide (Resource Management) CE".

4. Start recording of the operation log

   Execute the rcxadm logctl start command to start recording the operation log.
   When the rcxadm logctl start command is executed, the operation logs will be recorded for the configured retention period from the date recording of operation logs is started.
   Days when no events occur, or days when recording is not possible due to the manager being stopped are not counted as dates for recording.

   > 📌 **Note**
   > ....
   >
   > - When the settings of the OS [Date and Time Properties] dialog have been changed after starting the recording of operation logs
   >
   >   It may not be possible to correctly display or delete the operation logs.
   >
   > - When changing the settings of the OS [Date and Time Properties] dialog after starting the recording of operation logs
   >
   >   Refer to "13.1.3 Retention".

- When a Cloud Edition license has been registered

  When starting the manager, recording of operation logs is started automatically.

13.1.3 Retention

This section explains the retention of operation logs.

- Periodic deletion

  Due to extended periods of operation or modification of retention periods, operation logs which have exceeded a certain retention period are periodically deleted.

  The timing of deletion (based on retention period checks) is set to take place as the first operation after the date changes.

🛈 Note

- The recording period is the retention period + 1. After periodic deletion is performed, the recording period will be equal to the retention period.

- Periodic deletion is executed when the next recording is started (the first recording after the date changes), and operation logs will be deleted in chronological order.

- Deletion

  Users can delete unnecessary operation logs by defining a retention period.

- Backup and Restore

  Use the following procedure for backup and restoration of operation logs.

  - Backup

    1. Confirm the "retention folder" for the operation logs.

    2. Stop recording operation logs.

    3. Back up the "retention folder" confirmed in 1.

    4. Start recording operation logs.

  - Restore

    1. Confirm the "retention folder" for the operation logs.

    2. Stop recording operation logs.

    3. Restore the backed-up folder into the "retention folder" confirmed in 1.

    4. Start recording operation logs.

- Modification of the settings in the [Date and Time properties] dialog after starting the recording of operation logs

  Use the following procedure to make changes.

  1. Stop recording operation logs.

  2. Display the operation logs and back up the necessary portions from the records.

  3. Confirm the "retention folder" for the operation logs.

  4. Empty the "retention folder" by moving all files in the "retention folder" checked in 3. to a new location.

  5. Modify the settings in the [Date and Time properties] dialog.

  6. Start recording operation logs.

For details on operations for operation logs, refer to "1.7.15 rcxadm logctl" in the "Reference Guide (Resource Management) CE".

Note

- Once recording operations are stopped, user operations are not recorded until the recording of logs is started again.

- Performing this procedure resets the recording period of operation logs to 0.

13.1.4 Scope of Operations Recorded in Operation Logs

The scope of operations recorded in operation logs and the character strings displayed in the Event column are as indicated below.

Table 13.1 Scope of Operations

Resource Types	Operations	Strings Displayed in the Event Column
L-Server	Creation	l_servers create
	Deletion	l_servers destroy
	Modification	l_servers update
	Powering on	l_servers start
	Powering off	l_servers stop
	Restarting	l_servers restart
	Disk addition	l_servers attach
	Disk detachment	l_servers detach
	Folder migration	folders move resource
	Migration	l_servers migrate
	Physical L-Server configuration	l_servers set_attrs
	Transmission of network information to physical L-Servers	l_servers setup
	Conversion	l_servers convert
	Reversion	l_servers revert
Image	Creation	server_images create
	Deletion	server_images destroy
	Restore	server_images restore
	Snapshot collection	server_images snapshot
L-Platform	Creation	l_platforms create
	Deletion	l_platforms destroy
	Modification	l_platforms update
Tenant	Creation	tenants create
	Deletion	tenants destroy
	Modification	tenants update
Resource Folders	Creation	folders create
	Deletion	folders destroy
	Modification	folders update

13.2 Audit Logs

This section explains audit logs.

By looking up audit logs, it is possible to find out *who* performed *what* operation *when*.

13.2.1 Configuration Management Audit Log

This section explains the configuration management audit log.

The file name, file size, and number of generations of the audit log are shown below:

Log name	Description	File size	Number of generations
vsys_audit_log	Audit logs are output to this log.	10 MB	10 generations (*1)

*1: If the number of saved generations exceeds 10 generations, old generations will be deleted, starting with the oldest generation.

The file size and the number of generations to be saved can be changed. Refer to "Procedure for changing the size of the file" and "Procedure for changing the number of generations to be saved" for details.

With default settings, audit logs will be held for approximately 50 days if 10 people use this product for approximately one hour per day per person. If necessary, back up audit logs at appropriate intervals according to the usage frequency. The names of the files to be backed up are shown below:

```
vsys_audit_log.[n] (where "n" is the generation number)
Example: To back up three generations' worth of files, the names of the files to be backed up are as
follows:
- vsys_audit_log.1
- vsys_audit_log.2
- vsys_audit_log.3
```

Output Destination

The log output destinations are shown below:

[Windows]

Output folder	Output destination file
<Installation directory for this product>\RCXCFMG\logs	vsys_audit_log.[n] (n is the number of generations)

[Linux]

Output folder	Output destination file
/var/opt/FJSVcfmg/logs	vsys_audit_log.[n] (n is the number of generations)

Output format

Audit logs are CSV files where the following items are output in the following order:

Output format
<date/time when the operation was performed>,<user ID>,<organization ID>,<operation ID>,<parameters>,<operation result>

Item	Description
date/time when the operation was performed	YYYY-MM-DD HH:MM:SS.sss (local time).
user ID	The user ID of the user that executed the operation.

Item	Description
organization ID	The organization ID of the user that executed the operation.
operation type	A string indicating the content of the operation. (*1)
parameters	The parameters specified by the request.
operation result	"SUCCESS" if the operation was successful and "FAILURE" if the operation failed.

*1: The operation types are as follows:

Operation type	Description
VSYS#deploy	Deploying a L-Platform.
VSYS#update	Reconfiguring a L-Platform.
VSYS#getList	Obtaining a list of L-Platforms.
VSYS#getDetail	Obtaining detailed information for a L-Platform.
VSYS#release	Returning all L-Platforms as a batch.
VSYS#lock	Locking a L-Platform.
VSYS#unlock	Unlocking a L-Platform.
VServer#create	Adding a server.
VServer#search	Obtaining server information.
VServer#stop	Stopping a server.
VServer#start	Starting a server.
VServer#release	Returning a server.
VServer#attach	Adding an expansion disk.
VServer#detach	Deleting an expansion disk.
VServer#changeSpec	Changing server performance.
VServer#backup	Creating a snapshot.
VServer#restore	Restoring a server.
VServer#removeBackup	Deleting a snapshot.
VServer#getBackupList	Obtaining a list of snapshots.
VServer#cancelError	Releasing the error status of snapshots or restorations.
VServer#addPatch	Registering patch information.
VServer#deletePatch	Deleting patch information.
VServer#getInitPW	Obtaining the initial password for a server.
VServer#cloning	Collecting a cloning image from a deployed server.
Event#notify	Notifying events that occurred on a server. With the current version, changes to the power status and migration events are notified.
EventLog#getList	Obtaining a list of event logs.
VSYS#setLoginDate	Updating the date/time when the user logged in to L-Platform Manager View.
VSYS#getLoginDate	Obtaining the date/time when the user logged in to the L-Platform Manager View.
VSYS#setUndeploy	Changing the status of a L-Platform, server or disk to "undeployed".
VSYS#flowDeploy	Deploying a L-Platform. (For flows: no operation after authorization.)
VSYS#flowEnableDeploy	Deploying a L-Platform. (For flows: operation to perform after authorization.)
VSYS#flowUpdate	Reconfiguring a L-Platform. (For flows: no operation after authorization.)

Operation type	Description
VSYS#flowEnableUpdate	Reconfiguring a L-Platform. (For flows: operation to perform after authorization.)
VSYS#flowRejectApplication	Rejecting deployment application.
VSYS#flowForward	Applying to deploy a L-Platform or change a configuration.
VSYS#flowError	Executing post-processing when an error has occurred with an application flow for deploying a L-Platform or changing a configuration.
VSYS#flowCancel	Canceling the application to deploy a L-Platform or change a configuration.
VSYS#flowSaveCancel	Canceling the application to deploy a L-Platform or change a configuration.
VSYS#flowCancelRetry	Canceling the flow for saving a configuration and then making another application.
VSYS#flowReleaseApplication	Applying to return a L-Platform.
VSYS#flowRelease	Returning all L-Platforms as a batch. (For flows: no operation after authorization.)
VSYS#flowEnableRelease	Returning all L-Platforms as a batch. (For flows: operation to perform after authorization.)
VSYS#flowReleaseForward	Setting the status of a return application to "forwarding complete".
VSYS#changeOrg	Changing a user ID or organization ID for a L-Platform.
VSYS#recoverSystem	Recovering a L-Platform.
VSYS#recoverServer	Recovering a server.
VSYS#recoverDisk	Recovering a disk.
VSYS#setRecoverInfo	Recovering a resource ID or disk number.
VSYS#setChangeInfo	Recovering a L-Platform name, server name, or server specification.
VSYS#setServerStatus	Recovering the status of a server.
Parameters#set	Registering or updating parameter information.
Parameters#getList	Obtaining a list of parameter information.
Parameters#getDetail	Obtaining detailed parameter information.
Parameters#delete	Deleting parameter information.
Softwares#create	Registering software information.
Softwares#getList	Obtaining a list of software.
Softwares#getDetail	Obtaining detailed software information.
Softwares#delete	Deleting software information.
Images#getList	Obtaining a list of images registered.
Images#register	Registering image information with this product.
Images#unregister	Deregistering image information from this product.
Images#update	Updating image information.
Images#search	Searching image information.
Images#getDetail	Obtaining detailed image information.
Images#getServerType	Obtaining a list of L-Server Templates.
Network#getList	Obtaining a list of networks.
Network#addCategory	Registering a network resource type.
Network#deleteCategory	Deleting a network resource type.
Network#getCategoryList	Obtaining a list of network types.
Templates#importPublic	Registering template information.

Operation type	Description
Templates#search	Searching a L-Platform template.
Templates#getDetail	Obtaining detailed L-Platform template information.
Templates#changeShow	Changing the settings as to whether L-Platform templates can be displayed.
Templates#deletePublic	Deleting L-Platform templates.
DeployMaster#getTemplate	Obtaining a deployment master from a L-Platform template.
DeployMaster#save	Saving configuration information.
DeployMaster#getSaveList	Obtaining a list of configuration information.
DeployMaster#getDetail	Obtaining detailed configuration information.
DeployMaster#delete	Deleting configuration information.
DeployMaster#setStatus	Setting the status of configuration information.
VSYS#getPoolList	Obtaining a list of resource pools for ServerView Resource Orchestrator.

Procedure for changing output destination

Use the following procedure to change the audit log output destination.

1. Rewrite the settings file.

   The following table shows the settings file and the location to change:

   [Windows]

Log name	Settings file	Location to change (one location)
vsys_audit_log	*<Installation directory for this product>*\RCXCFMG\config\vsys_log4j.xml	<param name="File" value="C:\ProgramData\Fujitsu\SystemwalkerCF-MG\logs\vsys_audit_log" />

   [Linux]

Log name	Settings file	Location to change (one location)
vsys_audit_log	/etc/opt/FJSVcfmg/config/vsys_log4j.xml	<param name="File" value="/var/opt/FJSVcfmg/logs/vsys_audit_log" />

2. Restart the manager.
   Refer to "7.2 Starting and Stopping the Manager" in the *Setup Guide CE* for information on how to Restart the manager.

Procedure for changing the size of the file

Use the following procedure to change the audit log file size.

1. Rewrite the settings file.

   The location to change is shown below:

   [Windows]

Log name	Settings file	Location to change (one location)
vsys_audit_log	*<Installation directory for this product>*\RCXCFMG\config\vsys_log4j.xml	Change the underlined part of the <param name="MaxFileSize" value="10MB" /> element under the <appender name="auditfileout"class="org.apache.log4j.RollingFileAppender"> element to the desired value. Example: value="100MB" (to change the size of the audit log file to 100 MB)

[Linux]

Log name	Settings file	Location to change (one location)
vsys_audit_log	/etc/opt/FJSVcfmg/config/vsys_log4j.xml	Change the underlined part of the <param name="MaxFileSize" value="10MB" /> element under the <appender name="auditfileout"class="org.apache.log4j.RollingFileAppender"> element to the desired value. Example: value="100MB" (to change the size of the audit log file to 100 MB)

2. Restart the manager.
   Refer to "7.2 Starting and Stopping the Manager" in the *Setup Guide CE* for information on how to Restart the manager.

Procedure for changing the number of generations to be saved

Use the following procedure to change the number of audit log generations to be saved.

1. Rewrite the settings file.

   The location to change is shown below:

   [Windows]

Log name	Settings file	Location to change (one location)
vsys_audit_log	*<Installation directory for this product>* \RCXCFMG\config\vsys_log4j.xml	Change the underlined part of the <param name="MaxBackupIndex" value="9" / /> element under the <appender name="auditfileout"class="org.apache.log4j.RollingFileAppender"> element to the desired value. Example: value="100" (to change the number of audit log generations to 100)

   [Linux]

Log name	Settings file	Location to change (one location)
vsys_audit_log	/etc/opt/FJSVcfmg/config/vsys_log4j.xml	Change the underlined part of the <param name="MaxBackupIndex" value="9" / /> element under the <appender name="auditfileout"class="org.apache.log4j.RollingFileAppender"> element to the desired value. Example: value="100" (to change the number of audit log generations to 100)

2. Restart the manager.
   Refer to "7.2 Starting and Stopping the Manager" in the *Setup Guide CE* for information on how to Restart the manager.

13.2.2 Audit Logs of Output by the Tenant Management, Accounting, Access Control and System Condition

This section explains audit logs of output by the tenant management, accounting, access control and system condition functions.

P **Point**
. . . .
- If L-Platform Management is operated, audit logs will be output to Configuration Manager. Refer to "13.2.1 Configuration Management Audit Log"for details.

- Audit logs relating to the registration, modification or deletion of infrastructure administrators, infrastructure operators, infrastructure monitors, administrators, operators and/or monitors can be checked in the OpenDS access log.
  The storage locations and file names of OpenDS access logs are as follows.

[Windows]

> *<OpenDS Installation directory>*\opends\logs\access

[Linux]

> /opt/fujitsu/ServerViewSuite/opends/logs/access

Refer to the OpenDS website for details on OpenDS access logs.

> URL: https://docs.opends.org/2.2/page/DefAccessLog (As of February2012)

Output format

Audit logs are CSV files where the following items are output in the following order:

Output format
operation date/time,user ID,tenant name,operation type,operation information,operation result

Item	Description
operation date/time	The date/time when the operation was performed. The date/time is output using the following format: YYYY-MM-DD HH:MM:SS.sss (local time)
user ID	The user ID of the user that performed the operation.
tenant name	The tenant name of the user that executed the operation. If the operation is performed from tenant management GUI, the tenant name is fixed as "ctmgadm".
operation type	The type of the operation performed. Refer to "Operation types and operation information" for details.
operation information	Detailed information for the operation type. Refer to "Operation types and operation information" for details.
operation result	The result of the operation performed. One of the following values is output: SUCCESS: When the operation was successful FAILURE: When the operation failed

Output files

Audit logs are output to the following files:

Function	Output file
Tenant management (GUI operations from the ROR Console)	[Windows] *<Installation directory for this product>*\RCXCTMG\SecurityManagement\log\ctsec_audit_a.log [Linux] /var/opt/FJSVctsec/log/ctsec_audit_a.log
Tenant management (creating users from the ROR Console:	[Windows] *<Installation directory for this product>*\RCXCTMG\SecurityManagement\log\ctsec_audit_s.log

Function	Output file
Provisional account registration method)	[Linux] /var/opt/FJSVctsec/log/ctsec_audit_s.log
Accounting	[Windows] <*Installation directory for this product*>\RCXCTMG\Charging\log\ctchg_audit.log [Linux] /var/opt/FJSVctchg/log/ctchg_audit.log
Access Control	[Windows] <*Installation directory for this product*>\RCXCTMG\SecurityManagement\log\ctac_audit.log [Linux] /var/opt/FJSVctsec/log/ctac_audit.log
System condition	[Windows] <*Installation directory for this product*>\SWRBAM\CMDB\FJSVcmdbm\var\log\audit\uigui\cmdb_audit.log [Linux] /opt/FJSVcmdbm/var/log/audit/uigui/cmdb_audit.log

Procedure for changing the file size and the number of generations held

By default, audit log files are rotated when they reach 10 MB.
To change the maximum size of audit log files or the maximum number of generations held, perform the following procedure:

1. Stop the manager.
   Refer to "7.2 Starting and Stopping the Manager" in the *Setup Guide CE* for information on how to stop the manager.

2. Edit the appropriate items in the following definition files:

   - Definition files

Function	Definition file
Tenant management (GUI operations from the ROR Console)	[Windows] <*Installation directory for this product*>\RCXCTMG\conf\auditsecalog4j.xml [Linux] /etc/opt/FJSVctmg/conf/auditsecalog4j.xml
Tenant management (creating users from the ROR Console: Provisional account registration method)	[Windows] <*Installation directory for this product*>\RCXCTMG\conf\auditsecslog4j.xml [Linux] /etc/opt/FJSVctmg/conf/auditsecslog4j.xml
Accounting	[Windows] <*Installation directory for this product*>\RCXCTMG\conf\auditchglog4j.xml [Linux] /etc/opt/FJSVctmg/conf/auditchglog4j.xml
Access Control	[Windows] <*Installation directory for this product*>\RCXCTMG\conf\auditaclog4j.xml

Function	Definition file
	[Linux] /etc/opt/FJSVctmg/conf/auditaclog4j.xml
System condition	[Windows] <*Installation directory for this product*>\SWRBAM\CMDB\FJSVcmdbm\CMDBConsole\WEB-INF\classes\log4j.properties
	[Linux] /opt/FJSVcmdbm/CMDBConsole\WEB-INF\classes\log4j.properties

- Setting items

Setting item	Description
MaxFileSize	This item sets the maximum size of audit log files. The file size can be specified using a combination of an integer greater than 0 and a unit (KB, MB or GB). (*1), (*2) Example: <param name="MaxFileSize" value="500KB"/>
MaxBackupIndex	This item sets the maximum number of generations of the audit log file. An integer greater than 0 can be specified. (*1) Example: <param name="MaxBackupIndex" value="50"/>

*1: Do not specify decimal fractions. Also, do not leave a blank space.

*2: Do not specify a maximum file size that is larger than the size of the disk. Conversely, do not set values that are too small for the maximum file size, or else the logs will be overwritten frequently.

3. Start the manager.

Refer to "7.2 Starting and Stopping the Manager" in the *Setup Guide CE* for information on how to start the manager.

Operation types and operation information

The following table shows the operation types and operation information that are output to audit logs:

Function	Operation type	Content	Operation information (*1)
Tenant management (GUI operations from the ROR Console)	registUser	Notify user registration	"mail=""xxx@com"""
	createUser	Create users	"userid=""<*user ID of the user created*>""&mail=""xxx@com""&lastname=""<*last name*>""&firstname=""<*first name*>""&auth=""tenant_admin|tenant_operator|tenant_monitor|tenant_user""&explanation=""xxxx""&corporatename=""fujitsu""&emergencymail=""yyy@com""&emergencytel=""0000""" (only if the infrastructure administrator performed or the tenant administrator performed by the direct registration method)
	deleteUser	Delete users	"userid=""<*user ID of the user deleted*>"""
	updateUser	Update user information	"userid=""<*user ID of the user updated*>""&mail=""xxx@com""&lastname=""<*last name*>""&firstname=""<*first name*>""&auth=""infra_admin|infra_operator|administrator|monitor|operator|tenant_admin|tenant_operator|tenant_monitor|tenant_user""&explanation=""xxxx""&corporatename=""fujitsu""&emergencymail=""yyy@com""&emergencytel=""0000"""
	listUser	Get a list of user information	None.
	moveUser	Relocate users	"userid=""<*user ID of the user that has been relocated*>""&oldorgid=""<*tenant name of the original tenant*>""

Function	Operation type	Content	Operation information (*1)
			&neworgid="" *tenant name of the tenant to which the user has been relocated*"""
	updatePassword	Update passwords	"userid=""*<user ID of the user whose password has been updated>*"""
	createOrg (*2) (*3)	Create an tenant	"orgid=""*<tenant name of the tenant that has been created>*""&orgname=""*<tenant name>*"" &mail=""xxx@com""&globalpool=""*<global pool that has been set>*"""
	deleteOrg (*3)	Delete tenants	"orgid=""*<tenant name of the tenant that has been deleted>*"""
	updateOrg (*2) (*3)	Update tenant information	"orgid=""*<tenant name of the tenant that has been updated>*""&orgname=""*<tenant name>*"" &mail=""xxx@com""&globalpool=""*<global pool that has been set>*"""
	listOrg	Get a list of tenant information	None.
Tenant management (creating users from the ROR Console: Provisional account registration method)	createUser	Create users	"userid=""*<user ID of the user created>*""&mail=""xxx@com"" &lastname=""*<last name>*""&firstname=""*<first name>*"""&auth=""tenant_user"" &explanation=""xxxx""&corporatename=""fujitsu"" &emergencymail=""yyy@com""&emergencytel=""0000"""
Accounting	updatePMaster	Update product master	None.
	listPMaster	Get a list of product master	None.
	updateMlogSch	Update periodic log schedule settings	"use=""yes|no""&time=""*<time of output of periodic log>*""&type=""*<frequency of output of periodic log>*""&day=""*<day of output of periodic log>*"""
	listMlogSch	Get a list of periodic log schedule settings	"use=""yes|no""&time=""*<time of output of periodic log>*""&type="" *frequency of output of periodic log*""&day=""*<day of output of periodic log>*"""
	listMeteringlog	Get a list of metering logs	"start=""*<start date of the acquisition period>*""&end=""*<end date of the acquisition period>*"" &type=""event|period"""
	deleteMlog	Delete metering logs	"retention=""*<log entry retention period>*"""
Access Control	updateAuthority	Access authority modifications	"roleid=""*<role name of modification target>*"" &actionid=""*<action ID of modification target>*"" &permission=""*<allow/deny status of specified action>*""" (The above information will be output as follows: one information item when a role name is specified, or if a file is specified, the number of information items will match the number of action IDs.)
System condition (*4)	dispUsageStatus	Display usage condition	None.

*1: If a value is not set for an item, """" is output.

An example is shown below.

```
... &globalpool=""""...
```

*2: If multiple global pools have been set, the global pools are output separated by commas.

An example is shown below.

```
...&globalpool=""/AddressPool,/ImagePool""...
```

*3: For the operation result of createOrg, deleteOrg, or updateOrg, the processing result will be output. Use the operation log (resource operation) to check the actual processing result. Refer to "13.1 Operation Logs" for information on how to check the operation log (resource operation).

*4: Audit logs for usage condition are output only when operations are performed from the ROR Console.

13.3 Operation Logs (Activity)

This section explains operation logs.

Operation logs are used as maintenance information when investigating and dealing with errors.

13.3.1 Operation Logs and Definition Files for ROR Console

The destination of the files to output operation logs and definition files for maintenance information of the ROR Console are shown below:

Copy the files described below to collect maintenance information.

[Windows]

Type	Destination of files output	Description
Operation log	<Installation directory for this product>\RCXCTMG\SecurityManagement\log*	Operation logs of each function used in the ROR Console are output.
	<Installation directory for this product>\RCXCTMG\MyPortal\log*	
	%TEMP%\set_*.log	
	%TEMP%\unset_*.log	
Definition file	<Installation directory for this product>\RCXCTMG\SecurityManagement\conf*	Definition files to regulate the operation of the ROR Console.
	<Installation directory for this product>\RCXCTMG\MyPortal\config*	

[Linux]

Type	Destination of files output	Description
Operation log	/var/opt/FJSVctsec/log/*	Operation logs of each function used in the ROR Console are output.
	/tmp/set_*.log	
	/tmp/unset_*.log	
Definition file	/etc/opt/FJSVctsec/conf/*	Definition files to regulate the operation of the ROR Console.

13.3.2 Operation Logs and Definition Files for System Condition

The destination of the files to output the operation logs used for maintenance information for the system condition and their definition files are shown below:

Copy the files described below to collect maintenance information.

[Windows]

Type	Destination of files output	Description
Operation log	*<Installation directory for this product>*\SQC_DATA\log*	Operation logs of the usage condition are output.
	<Installation directory for this product>\SQC_DATA\trace*	
	<Installation directory for this product>\SQCM\bin\ssqcinst.log	
	<Installation directory for this product>\SWRBAM\CMDB\FJSVcmdbm\resources\log*	
	<Installation directory for this product>\SWRBAM\CMDB\FJSVcmdbm\var\log*	
	<Installation directory for this product>\SWRBAM\CMDB\FJSVcmdbm\Shunsaku\log\conductor*	
	<Installation directory for this product>\SWRBAM\CMDB\FJSVcmdbm\Shunsaku\log\director*	
	<Installation directory for this product>\SWRBAM\CMDB\FJSVcmdbm\Shunsaku\log\searcher*	
	<Installation directory for this product>\SWRBAM\CMDB\FJSVcmdbm\Shunsaku\log\sorter*	
Definition file	*<Installation directory for this product>*\SQC_DATA\control*.ini	Definition files to regulate the operation of the usage condition.
	<Installation directory for this product>\SQC_DATA\control*.xml	
	<Installation directory for this product>\SQC_DATA\control*.txt	
	<Installation directory for this product>\SQC_DATA\control*.conf	
	<Installation directory for this product>\SQC_DATA\control*.dat	
	<Installation directory for this product>\SQC_DATA\control*.mode	
	<Installation directory for this product>\SQC_DATA\control*.trd	
	<Installation directory for this product>\SQC_DATA\control*.ttd	
	<Installation directory for this product>\SQC_DATA\control*.sql	
	<Installation directory for this product>\SQC_DATA\control*.linux	
	<Installation directory for this product>\SQC_DATA\control*.dist	
	<Installation directory for this product>\SQC_DATA\control*.sample	
	<Installation directory for this product>\SQC_DATA\control*.template	
	<Installation directory for this product>\SQC_DATA\control*Config	
	<Installation directory for this product>\SQC_DATA\control\data*	
	<Installation directory for this product>\SQC_DATA\control\seq*	
	<Installation directory for this product>\SQC_DATA\control*.cfg	
	<Installation directory for this product>\SWRBAM\CMDB\FJSVcmdba\var\mdr_*\mdr.properties	
	<Installation directory for this product>\SWRBAM\CMDB\FJSVcmdbm\etc*	
	<Installation directory for this product>\SWRBAM\CMDB\FJSVcmdbm\resources*.ini	
	<Installation directory for this product>\SWRBAM\CMDB\FJSVcmdbm\axis2\WEB-INF\services\fcmdb\cmdb.properties	
	<Installation directory for this product>\SWRBAM\CMDB\FJSVcmdbm\axis2\WEB-INF\services\mdr_*\cmdb.properties	
	<Installation directory for this product>\SWRBAM\CMDB\FJSVcmdba\etc*	
	<Installation directory for this product>\SWRBAM\CMDB\Shunsaku\etc\system*.cfg	

Type	Destination of files output	Description
	<Installation directory for this product>\SWRBAM\CMDB\Shunsaku\etc\conductor*.cfg	
	<Installation directory for this product>\SWRBAM\CMDB\Shunsaku\etc\director*.cfg	
	<Installation directory for this product>\SWRBAM\CMDB\Shunsaku\etc\searcher*.cfg	
	<Installation directory for this product>\SWRBAM\CMDB\Shunsaku\etc\sorter*.cfg	

[Linux]

Type	Destination of files output	Description
Operation log	/var/opt/FJSVssqc/log/*	Operation logs of the usage condition are output.
	/var/opt/FJSVssqc/temp/ssqcinst.log	
	/opt/FJSVcmdbm/resources/log/*.log	
	/opt/FJSVcmdbm/var/log/*.log	
	/opt/FJSVcmdbm/var/Shunsaku/log/conductor/*	
	/opt/FJSVcmdbm/var/Shunsaku/log/director/*	
	/opt/FJSVcmdbm/var/Shunsaku/log/searcher/*	
	/opt/FJSVcmdbm/var/Shunsaku/log/sorter/*	
Definition file	/etc/opt/FJSVssqc/*	Definition files to regulate the operation of the usage condition.
	/etc/opt/FJSVssqc/*Config	
	/etc/opt/FJSVssqc/data/*	
	/etc/opt/FJSVssqc/seq/*	
	/opt/FJSVcmdba/var/mdr_*/mdr.properties	
	/opt/FJSVcmdbm/etc/*	
	/opt/FJSVcmdbm/resources/*.ini	
	/opt/FJSVcmdbm/axis2/WEB-INF/services/fcmdb/cmdb.properties	
	/opt/FJSVcmdbm/axis2/WEB-INF/services/mdr_*/cmdb.properties	
	/opt/FJSVcmdba/etc/*	
	/opt/FJSVshnsk/etc/system/*.cfg	
	/opt/FJSVshnsk/etc/conductor/*.cfg	
	/opt/FJSVshnsk/etc/director/*.cfg	
	/opt/FJSVshnsk/etc/searcher/*.cfg	
	/opt/FJSVshnsk/etc/sorter/*.cfg	

13.3.3 Operation Logs for Dashboard

The destination of the files to output operation logs used for maintenance information for dashboard is shown below.

Copy the files described below to collect maintenance information.

[Windows]

Type	Destination of files output	Description
Operation log	*<Installation directory for this product>*\IAPS\J2EE\var\deployment\ijserver \IBPMMServer\apps\ibpmm.war\log*	Operation logs of the dashboard are output.
	<Installation directory for this product>\IAPS\J2EE\var\deployment\ijserver \IBPMMSensor\apps\ibpms.war\log\agent* (*1)	

*1: This operation log may not exist, depending on the product installation situation. There is no need to collect this operation log if it does not exist.

[Linux]

Type	Destination of files output	Description
Operation log	/var/opt/FJSVj2ee/deployment/ijserver/IBPMMServer/apps/ibpmm.war/log/*	Operation logs of the dashboard are output.
	/var/opt/FJSVj2ee/deployment/ijserver/IBPMMSensor/apps/ibpms.war/log/agent/* (*1)	

*1: This operation log may not exist, depending on the product installation situation. There is no need to collect this operation log if it does not exist.

13.3.4 Operation Logs and Definition Files for Accounting

The destination of the files to output operation logs and definition files for maintenance information of the accounting are shown below:

Copy the files described below to collect maintenance information.

[Windows]

Type	Destination of files output	Description
Operation log	<Installation directory for this product>\RCXCTMG\Charging\log\productmaintain.log (*1)	The execution result of the productmaintain command is output. (*2)
	<Installation directory for this product>\RCXCTMG\Charging\log\ctchg_command.log (*1)	The execution result of the ctchg_getmeterlog command is output. (*3)
	<Installation directory for this product>\RCXCTMG\Charging\log\chgschedule.log (*1)	The execution result of the ctchg_chgschedule command is output. (*4)
	<Installation directory for this product>\RCXCTMG\Charging\log\metering_period.log (*1)	The execution result of create processing for the periodic log is output. (*5)
	<Installation directory for this product>\RCXCTMG\Charging\log\metering_log_db_delete.log (*1)	The execution result of delete processing for the metering log is output. (*6)
	<Installation directory for this product>\RCXCTMG\Charging\rails\sop_resource\log*	Operation logs (when a accounting function other than the above is used) are output.
Definition file	<Installation directory for this product>\RCXCTMG\Charging\conf*	Definition file that defines the operation of accounting.

*1: This log file is 5 MB in size and holds 10 generations.
*2: Refer to "5.3 Product Master Maintenance Command Messages" in the *Messages CE* for information on the execution result that is output.

*3: Refer to "5.1 Metering Log Output Command Messages" in the *Messages CE* for information on the execution result that is output.
*4: Refer to "5.2 Change Periodic Log Schedule Settings Command Messages" in the *Messages CE* for information on the execution result that is output.
*5: Refer to "9.1 Metering Periodic Log Creation Processing Messages" in the *Messages CE* for information on the execution result that is output.
*6: Refer to "9.2 Metering Log Deletion Processing Messages" in the *Messages CE* for information on the execution result that is output.

[Linux]

Type	Destination of files output	Description
Operation log	/var/opt/FJSVctchg/log/productmaintain.log (*1)	The execution result of the productmaintain command is output. (*2)
	/var/opt/FJSVctchg/log/ctchg_command.log (*1)	The execution result of the ctchg_getmeterlog command is output. (*3)
	/var/opt/FJSVctchg/log/chgschedule.log (*1)	The execution result of the ctchg_chgschedule command is output. (*4)
	/var/opt/FJSVctchg/log/metering_period.log (*1)	The execution result of create processing for the periodic log is output. (*5)
	/var/opt/FJSVctchg/log/metering_log_db_delete.log (*1)	The execution result of delete processing for the metering log is output. (*6)
	/var/opt/FJSVctchg/rails/sop_resource/log/*	Operation logs (when a accounting function other than the above is used) are output.
Definition file	/etc/opt/FJSVctchg/conf/*	Definition file that defines the operation of accounting.

*1: This log file is 5 MB in size and holds 10 generations.
*2: Refer to "5.3 Product Master Maintenance Command Messages" in the *Messages CE* for information on the execution result that is output.
*3: Refer to "5.1 Metering Log Output Command Messages" in the *Messages CE* for information on the execution result that is output.
*4: Refer to "5.2 Change Periodic Log Schedule Settings Command Messages" in the *Messages CE* for information on the execution result that is output.
*5: Refer to "9.1 Metering Periodic Log Creation Processing Messages" in the *Messages CE* for information on the execution result that is output.
*6: Refer to "9.2 Metering Log Deletion Processing Messages" in the *Messages CE* for information on the execution result that is output.

13.3.5 Operation Logs for Access Control

The destination of the files to output operation logs used for maintenance information for access control is shown below.

Copy the files described below to collect maintenance information.

[Windows]

Type	Destination of files output	Description
Operation log	*<Installation directory for this product>*\RCXCTMG\SecurityManagement\log \ctac_command.log (*1)	Execution results are output for access authority customize commands. (*2)

    *1: This log file is 5 MB in size and holds 10 generations.
    *2: Refer to "5.3 Messages Starting with ctac" in the *Messages CE* for information on the execution result that is output.

[Linux]

Type	Destination of files output	Description
Operation log	/var/opt/FJSVctsec/log/ctac_command.log (*1)	Execution results are output for access authority customize commands. (*2)

    *1: This log file is 5 MB in size and holds 10 generations.
    *2: Refer to "5.3 Messages Starting with ctac" in the *Messages CE* for information on the execution result that is output.

13.3.6 Operation Log for the Application Server

The operation log for the application server in the execution environment can be collected by using the iscollectinfo command of Interstage Application Server. Refer to the *Interstage Application Server Reference Manual (Command Edition)* on the iscollectinfo command for details.

The format of the iscollectinfo command is shown below:

```
iscollectinfo -d <destination directory to output operation log>
```

When the iscollectinfo command is executed, the operation log by the following format is stored under the specified directory.

[Windows]

```
<destination directory to output operation log>\collect\<YYYYMMDDHHMMSS>
```

[Linux]

```
<destination directory to output operation log>/collect/<YYYYMMDDHHMMSS>/default
```

<YYYYMMDDHHMMSS> consists of four characters for the year, two for the month, two for the day, two for hours, two for minutes, and two for seconds. For instance, 20110123123456 means 12:34:56 January 23, 2011.

13.4 Investigation Logs

This section explains investigation logs.

Investigation logs are used as maintenance information when investigating and dealing with errors.

13.4.1 Investigation Logs on Admin Servers

The investigation logs on Admin Servers are classified into the following types:

Log name	Description	File size	Number of generations
vsys_trace_log	Trace logs for the management of L-Platform template and L-Platform are output to this log.	10MB	10 generations (*1)
vsys_batch_log	Trace logs for the batch processing section of the management of L-Platform template and L-Platform are output to this log.		
myportal_trace.log	Trace logs for the Manager View are output to this log.		
cfmg_api_log	Logs for the CFMG APIs are output to this log.		
Event log	Information such as errors that occur while the Manager View is being used is output to this log. Refer to "14 Messages Starting with VSYS" in the *Message Guide CE* for information on event logs.	-	-

*1: If this number is exceeded, old generations will be deleted, starting with the oldest generation.

Output Destination

The log output destinations are shown below:

[Windows]

Output folder	Output destination file
<Installation directory for this product>\RCXCFMG\logs	vsys_trace_log, vsys_batch_log, cfmg_api_log
<Installation directory for this product>\RCXCTMG\MyPortal\log	myportal_trace.log

[Linux]

Output destination directory	Output destination file
/var/opt/FJSVcfmg/logs	vsys_trace_log, vsys_batch_log, cfmg_api_log
/var/opt/FJSVctmyp/log	myportal_trace.log

Output format

Output format
<date/time> <log level> <message ID> <message text>

Item	Description	
date/time	yyyy-mm-dd hh:mm:ss,sss	
log level	One of the following:	
	info	Information level message
	warn	Warning level message
	error	Error level message
	fatal	Fatal level message
message ID (*1)	Prefix and message number:	

Item	Description
	- The prefix for myportal_trace.log is "MGRV". - The prefix for cfmg_api_log is "PAPI". - The prefix for all other logs is "VSYS".
message text (*1)	Message content

*1: Refer to the "'Message Guide CE" for information on the message ID and message text.

Procedure for changing the investigation output destination

Use the following procedure to change the output destination for investigation logs.

1. Rewrite the settings files corresponding to each log.

    The following table shows the settings file and the location to change:

    [Windows]

Log name	Settings file	Location to change (one location)
vsys_trace_log	*<Installation directory for this product>*\RCXCFMG\config\vsys_log4j.xml	\<param name="File" value="C:\ProgramData\Fujitsu\SystemwalkerCF-MG\logs\vsys_trace_log" />
vsys_batch_log	*<Installation directory for this product>*\RCXCFMG\config\batch_log4j.xml	\<param name="File" value="C:\ProgramData\Fujitsu\SystemwalkerCF-MG\logs\vsys_batch_log" />
myportal_trace.log	*<Installation directory for this product>*\RCXCTMG\MyPortal\config\managerview_log4j.xml	\<param name="file" value=" C:/Fujitsu/ROR/RCXCTMG/MyPortal/log/myportal_trace.log" />
cfmg_api_log	*<Installation directory for this product>*\RCXCFMG\config\api_log4j.xml	\<param name="file" value="C:\ProgramData\Fujitsu\SystemwalkerCF-MG\logs\cfmg_api_log" />

    [Linux]

Log name	Settings file	Location to change (one location)
vsys_trace_log	/etc/opt/FJSVcfmg/config/vsys_log4j.xml	\<param name="File" value="/var/opt/FJSVcfmg/logs/vsys_trace_log" />
vsys_batch_log	/etc/opt/FJSVcfmg/config/batch_log4j.xml	\<param name="File" value="/var/opt/FJSVcfmg/logs/vsys_batch_log" />
myportal_trace.log	/etc/opt/FJSVctmyp/config/managerview_log4j.xml	\<param name="file" value="/var/opt/FJSVctmyp/log/myportal_trace.log" />
cfmg_api_log	/etc/opt/FJSVcfmg/config/api_log4j.xml	\<param name="File" value="/var/opt/FJSVcfmg/logs/cfmg_api_log" />

2. Restart the manager.
    Refer to "7.2 Starting and Stopping the Manager" in the *Setup Guide CE* for information on how to Restart the manager.

Part 5　High Availability

Chapter 14 Failover

This chapter explains failover.

14.1 High Availability of Managed Resources

This section explains how to realize high availability of managed resources.

The methods of environment creation and operation for enabling higher availability of managed resources vary depending on resources involved.

- Servers

  Refer to "14.1.1 L-Server High Availability".

- Blade chassis

  Refer to "14.1.2 Blade Chassis High Availability".

- Storage chassis

  Refer to "14.1.3 Storage Chassis High Availability".

14.1.1 L-Server High Availability

This section explains high availability for L-Servers.

Regardless of the server type, select the "HA" checkbox on the "Server" tab to perform redundancy settings when creating an L-Server.

- For physical L-Servers

  Select the "HA" checkbox to enable the selection of the pool of a spare server.

  The server pool of the spare server that the physical server will use for automatic switchover is registered in can be specified.

  For details on the [Server] tab, refer to "10.2.2 [Server] Tab" of the "User's Guide for Infrastructure Administrators (Resource Management) CE".
  For the details on conditions for switchover to spare servers, refer to "8.3 Server Switchover Conditions" of the "User's Guide VE".

- For virtual L-Servers

  The settings depend on the server virtualization software used.

  Refer to "10.3.2 [Server] Tab" of the "User's Guide for Infrastructure Administrators (Resource Management) CE".

Checks of Spare Server Models and Configurations

The L-Server definition and spare server configuration are checked when configuring server redundancy during creation or modification of a physical L-Server.

Confirmation is performed on the following items of an L-Server definition and spare server configuration:

- Server Model

  Check if there is a server compatible with the L-Server definition in the specified server pool.

  The compatibility of server models is evaluated by the definition file for checks on spare server models and configurations.

  The definition file is created when installing managers.

  When installing a new compatible server model, update the definition file by adding the server model.

  In the following cases, the same server model of physical server as the server specified in the L-Server definition is selected.

    - When there is no definition file

    - When there is an error in definitions

- Number of NICs

  Check the number of NICs mounted on a compatible server and L-Server.

  A server is considered as a server satisfying the conditions, in the following cases:

    - The number of NICs mounted on the compatible server is the same as the number in the L-Server definition

    - The number is more than the number in the L-Server definition

Selection of Suitable Spare Servers

When the "Use a low spec server" checkbox is not selected, a spare server is automatically set.

Based on the following conditions, an L-Server definition is compared to physical L-Servers existing in the specified resource pool as a spare server:

- When specifying the model name on creation of a physical L-Server

    - If the "model name" is the same or compatible

    - Number of NICs

- When specifying the CPU or memory on creation of a physical L-Server

    - CPU core count

    - CPU Clock Speed

    - Memory capacity

    - Number of NICs

  Configurations are not checked.

A server that satisfies or exceeds all conditions and has the nearest specifications to the L-Server definition is selected.

When the "Use a low spec server" checkbox is selected, physical servers with models matching that in the L-Server definition are selected as spare servers.

For details, refer to "D.8 Selection of a Physical Servers for Physical L-Servers" of the "Setup Guide CE".

Modification of Checks on Spare Server Models and Configurations

The switchover policy and the definition of server model compatibility can be modified.

Although the definition file is deployed when installing managers, a server model with a matching L-Server definition and physical server model is selected as a spare server in the following cases:

- When there is no definition file

- When there is an error in definitions

When the "Use a low spec server" checkbox is selected, physical servers with models matching that in the L-Server definition are selected as spare servers.

The definition file for checks on spare server models and configurations is stored in the following location.

Location of the Definition File

[Windows]
Installation_folder\Manager\etc\customize_data

[Linux]
/etc/opt/FJSVrcvmr/customize_data

Definition File Name

spare_server_config.rcxprop

Definition File Format

Describe the definition file in individual lines as below:

```
Key = Value
```

When adding comments, start with a number sign ("#").

Definition File Items

Specify the following items in a definition file.

Table 14.1 List of Items Specified in Definition Files for Checking Spare Server Models and Configurations

Item	Key	Value	Remarks
Policy of Switchover	OVERALL_POLICY	skip	Configure the check policy of the L-Server definition for the whole system and the spare server configuration.
		warning	
			- skip
			Omits the check of whether or not there is a server that satisfies the spare server conditions. Even if a server pool that does not satisfy the conditions is selected, creation and modification of an L-Server are performed without checking.
			- warning
		error	Server pools without servers that satisfy the spare server conditions are also displayed. When a server pool that does not satisfy the conditions is selected, a warning message is displayed during creation and modification of an L-Server, checking whether to continue the operation.
			- error
			Server pools without servers that satisfy the spare server conditions are not displayed. Therefore, a server pool that does not satisfy the spare server conditions cannot be selected. Server switchover is not possible when the destination cannot be found while performing the switchover, even if the check has been made in advance.
Compatibility of Server Model (*1)	SPARE_SVR_COMPAT*X* (*X* is a number from 0 - 255)	["*modelA*"," *modelB*"]	Define compatible server models as a group. When checking the L-Server definition and the spare server configuration, the server models in the same group are the target of switchover. Examples of server models are as below. - BX920 S1 - BX920 S2

*1: The value of SPARE_SVR_COMPAT is changeable. Server switchover may fail depending on the combination of changed values, such as when a server with no compatibility is set as a spare server.

Example Definition File

```
# Spare server check configuration

# Spare server check logic's policy: skip | warning
```

```
| error
OVERALL_POLICY=skip

# Server model compatibility list
SPARE_SVR_COMPAT0=["BX920 S1", "BX920 S2"]
```

14.1.2 Blade Chassis High Availability

This section explains high availability for when operating L-Servers on blade servers.

When the server is a physical L-Server for a blade server, this function which enables restarting of L-Servers, by manually switching over servers to spare servers when there are blade servers are specified as spare servers on other chassis.

Prerequisites

For details on prerequisites for high availability of blade chassis, refer to "3.4.1 Blade Chassis High Availability Design" of the "Setup Guide CE".

Installation

This section explains the preparations for configuration of server switchover.

Use the following procedure for configuration:

1. Register a server in a spare blade chassis in the server pool.

   Perform one of the following steps:

   - Register a server in a spare blade chassis in the server pool

   - Register a server in a spare chassis in the server pool for a spare server

2. Create an L-Server.

   For details, refer to "10.1 Creation Using an L-Server Template" or "10.2 Creation of Physical L-Servers Using Parameters" of the "User's Guide for Infrastructure Administrators (Resource Management) CE".

   In this case, perform redundancy for the L-Server.

   On the [Server] tab of the [Create an L-Server] dialog, set the following items.

   - Check the "HA" checkbox.

   - When the server in the chassis was registered in the spare server pool in step 1., specify the spare server pool.

Operations

This section explains how to perform switchover of L-Servers.

Use the following procedure to perform switchover of L-Servers:

1. A chassis error is detected.

   If the following events occur, determine whether to perform chassis switchover regarding the event as the chassis failure.

   - When both management blades cannot be accessed because of a management blade failure

   - Communication with the admin LAN is not possible

   - When communication is not possible because there is trouble with the LAN switches that connect with the admin LAN

2. Check the chassis on which the L-Server for which an error was detected.

   Execute the rcxadm chassis show command to check.
   For details on the rcxadm chassis show command, refer to "1.3.11 rcxadm chassis" in the "Reference Guide (Resource Management) CE".

3. Check if the status of the L-Server that is the source for switchover is stop.

   If the status of the L-Server is not stop, stop the L-Server.

   The L-Server cannot be stopped, as the management blade cannot be accessed. Stop the L-Server on the managed server, using the console of managed server.

   Note

   ···

   If switchover is performed while an L-Server in a chassis that has trouble is still operating, there is a possibility that another instance of the L-Server will be started and its disks damaged. Ensure the L-Server is stopped.

   ···

4. Place the server into maintenance mode.

   For details on how to place servers into maintenance mode, refer to "Appendix B Maintenance Mode" of the "User's Guide for Infrastructure Administrators (Resource Management) CE".

   Execute the rcxadm server command from the command line.
   For details on the rcxadm server command, refer to "1.3.12 rcxadm server" in the "Reference Guide (Resource Management) CE".

5. Start the L-Server.

   Start the L-Server on the switchover destination server.
   For details on how to start an L-Server, refer to "11.1.1 Starting an L-Server" of the "User's Guide for Infrastructure Administrators (Resource Management) CE".

6. Release the server that has been switched to from maintenance mode.

   For details on how to release servers from maintenance mode, refer to "Appendix B Maintenance Mode" of the "User's Guide for Infrastructure Administrators (Resource Management) CE".

   Execute the rcxadm server command from the command line.
   For details on the rcxadm server command, refer to "1.3.12 rcxadm server" in the "Reference Guide (Resource Management) CE".

Restoration

This section explains restoration.

Use the following procedure for restoration:

1. If a management blade has failed, replace it with new one. If an admin LAN or switches fail, replace them. After that, initialize the management blade. To initialize the management blade, select "controlled by VIOM" in the management window of the management blade. After performing the configuration to forcibly reset the local VIOM settings on the displayed screen, restart the management board. In either case, if any concerns arise, contact Fujitsu technical staff.

2. Mount a blade on the chassis.

3. After unregistering the restored chassis using the ROR console, register the chassis again.

4. After powering on the server in the restored chassis from the server resource tree, forcibly power off the server.

After restoring the blade chassis, use the following procedure to relocate the L-Server.

1. Stop an L-Server.

   For details on how to stop an L-Server, refer to "11.1.2 Stopping an L-Server" of the "User's Guide for Infrastructure Administrators (Resource Management) CE".

2. Perform modification of the physical server to use.

   In the "Modify an L-Server" dialog, specify the restored server for "Physical server".

   For details on how to modify the physical server to use, refer to "11.2.1 Modifying Specifications" of the "User's Guide for Infrastructure Administrators (Resource Management) CE".

3. Start the L-Server.

   For details on how to start an L-Server, refer to "11.1.1 Starting an L-Server" of the "User's Guide for Infrastructure Administrators (Resource Management) CE".

14.1.3 Storage Chassis High Availability

This section explains high availability of storage chassis connected to physical L-Servers.

If performing replication between two storage units of LUNs used by a physical L-Server, quick restoration of physical L-Servers is possible, even when storage units have failed.

This section explains the switchover of disks used by physical L-Servers, between two storage units on which replication of LUNs is managed by a single manager.

- When performing switchover of physical L-Servers and disks used by physical L-Servers in a Disaster Recovery environment, refer to "Chapter 15 Disaster Recovery".

Figure 14.1 Switchover of Operating or Standby Status of Storage
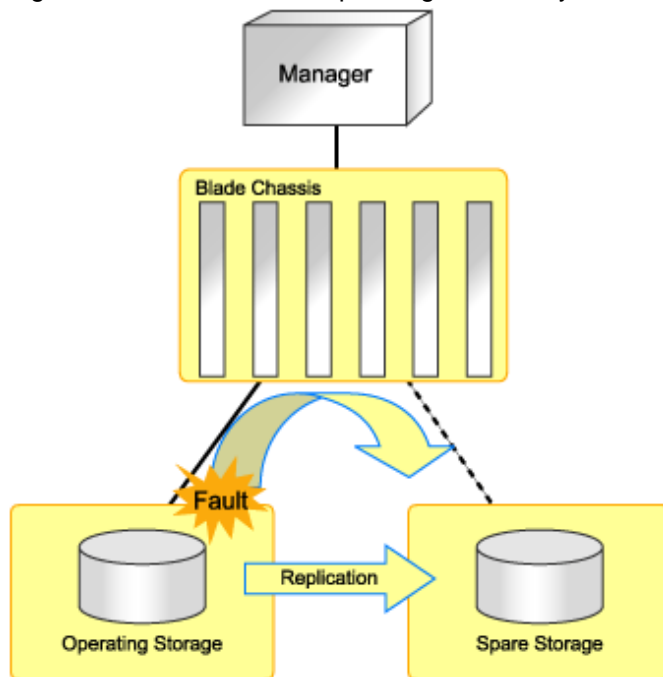
- When the disk resource is created using dynamic LUN mirroring, refer to "When dynamic LUN mirroring is used".

Prerequisites

For details on prerequisites for high availability of storage chassis, refer to "3.4.2 Storage Chassis High Availability Design" of the "Setup Guide CE".

Replication of Storage Unit LUNs

- For ETERNUS

  Define the LUN replication using ETERNUS SF AdvancedCopy Manager.

- For EMC CLARiiON

  Define the LUN replication using the MirrorView function.

- For EMC Symmetrix DMX storage and EMC Symmetrix VMAX storage

  Define the device replication using the SRDF function.

Replication Definition Files

The replication definition file must be created in advance. In the replication definition file, describe the relationship between the operating storage and the standby storage for replication.

The format of the replication definition file is as follows:

> *IP_address_of_operating_storage_unit,Operating_volume_identifier,IP_address_of_standby_storage_unit,Standby_volume_identifier*

Configure the definition file using a unique combination of an IP address for an operating or standby storage unit, and an identifier for an operating or standby volume. When the information overlaps in the replication definition file, an error will occur when creating a failover or a failback script.

- For ETERNUS

    The relationship for replication can be checked using ETERNUS SF AdvancedCopy Manager.

    Specify the IP address of a storage for the storage identifier. Check the IP address of a storage using the rcxadm storage list command.

    For details on volume identifiers, check them from ETERNUS SF AdvancedCopy Manager. Volume identifiers are written in hexadecimal format without zero suppression.

    #### 📑 Example

    ```
    192.168.1.24,0x0001,192.168.2.25,0x00
    05
    192.168.1.24,0x0002,192.168.2.25,0x00
    06
    192.168.3.25,0x0001,192.168.4.26,0x00
    05
    ```

    #### 📖 Information

    When replicating using the Copy Control Module of ETERNUS SF AdvancedCopyManager, a replication definition file can be created.

    For details on the rcxrepdef command, refer to "1.7.14 rcxrepdef" in the "Reference Guide (Resource Management) CE".

- For EMC CLARiiON

    The relationship for replication can be checked using the MirrorView function.

    Specify an IP address for the storage identifier. Check the IP address, using the rcxadm storage list command.

    For details on volume identifiers, check them using the MirrorView function. Volume identifiers are written in hexadecimal format without zero suppression.

    #### 📑 Example

    ```
    192.168.1.24,0x0001,192.168.2.25,0x000
    5
    192.168.1.24,0x0002,192.168.2.25,0x000
    6
    192.168.3.25,0x0001,192.168.4.26,0x000
    5
    ```

- For EMC Symmetrix DMX storage and EMC Symmetrix VMAX storage

The relationship for replication can be checked using the SRDF function.

Specify SymmID for the storage identifier. Check SymmID, using the rcxadm storage list command.

Specify a device for the volume identifier. Check the device, using the SRDF function. Volume identifiers are written in hexadecimal format without zero suppression.

📝 Example

```
000192601264,0001,000192601265,0005
000192601264,0002,000192601265,0006
000192601274,0001,000192601275,0005
```

When performing switchover from operating to standby (failover)

This section explains the procedure to perform switchover from operating storage units to standby storage units.

1. Create the replication definition file.

   For details on replication definition files, refer to "Replication Definition Files".

2. Create the following scripts by executing the rcxstorage -failover command.

   - failover script

   - Physical L-Server stopping script

   - Physical L-Server startup script

   For details on the rcxstorage command, refer to "1.7.13 rcxstorage" of the "Reference Guide (Resource Management) CE".

   - Create these scripts in units of operating storage.

   - These scripts are created based on the configuration information at the time which the command is executed. When changing configurations, create these scripts again.

   - Execute the rcxstorage command with the -failover option, when an operating and a standby storage unit are displayed in the storage tree. The script can be created as long as the operating storage unit is displayed in the storage tree, even if it has failed.

   📝 Note

   These scripts cannot be created when the operation target storage unit is not displayed in the storage tree.

3. Execute the physical L-Server stopping script on the server where the manager is being operated. This operation stops the physical L-Server targeted by the failover script. To forcibly stop the server without shutting down the operating system running on the L-Server, specify the -force option when executing the physical L-Server stopping script.

   If an error occurs during execution of the script, contact Fujitsu technical staff.

   📝 Note

   Physical L-Servers are stopped in the order of the entries in the physical L-Server stopping script. When specification of the order of stopping physical L-Servers is necessary, edit the physical L-Server stopping script.

4. Delete the zoning combining the WWPN of the HBA of the physical L-Server and the WWPN of the port of the operating storage from the Fibre Channel switch. For ETERNUS storage, this step is not necessary as the zoning for Fibre Channel switch will be deleted by Resource Orchestrator when the failover script is executed.

5. If the replication function for storage is in operation, stop it.

6. Execute the failover script on the server where the manager is being operated.

  - If the error "Message number 62513" occurs during script execution

    The Thin Provisioning and Thick Provisioning attributes of the operating disk resource and standby disk resource may be not the same. Check the replication definition file, and define the disk resource with the same attributes of Thin Provisioning and Thick Provisioning.

  - When an error other than the above has occurred

    Contact Fujitsu technical staff.

7. To access the standby storage, add the zoning combining the WWPN of the HBA of the physical L-Server and the WWPN of the port of the standby storage to the Fibre Channel switch. For ETERNUS storage, this step is not necessary as the zoning for Fibre Channel switch will be added by Resource Orchestrator when the failover script is executed.

8. When perform reading or writing for the LUN of the standby storage, modify the settings of replication if necessary.

9. Execute the physical L-Server startup script on the server where the manager is being operated. This operation starts the physical L-Server.

   If an error occurs during execution of the script, contact Fujitsu technical staff.

Note
. . . .
Physical L-Servers are started in the order of the entries in the physical L-Server startup script. When the specification of the order of starting physical L-Servers is necessary, edit the physical L-Server startup script.
. . . .

10. When operating an L-Platform, use the cfmg_syncdiskinfo command to reflect the information for switched disks on the L-Platform configuration information.

    [Windows]

    >*Installation_folder***RCXCFMG\bin\cfmg_syncdiskinfo** <RETURN>

    [Linux]

    # **/opt/FJSVcfmg/bin/cfmg_syncdiskinfo** <RETURN>

    For details on the cfmg_syncdiskinfo command, refer to "5.13 cfmg_syncdiskinfo (disk information synchronization)" in the "Reference Guide CE".

When performing switchover from standby to operating (failback)

This section explains the procedure for performing switchover from standby storage units to operating storage units.

1. Request repair of the operating storage units.

2. Using storage management software, restore the logical configuration (RAID, LUN) of an operating storage unit.

3. Using storage management software, check the LUN masking definition and LUN mapping definition of the operating storage unit. If the definitions relating to the WWPN of the HBA of the physical L-Server remain, delete them.

Information
. . . .
When the storage is ETERNUS, delete the affinity group for the LUN of the operating storage unit
. . . .

4. By modifying the settings of the replication function, perform replication of the storage unit from the operating to the standby, then wait until the status of the LUNs of the operating and standby storage become equivalent.

5. Prepare the replication definition file.

   Use the same replication definition file as that for failover. When changing the configuration after executing the failover script, correct the replication definition file.

6. Create the following scripts by executing the rcxstorage -failback command.

   - failback script

   - Physical L-Server stopping script

   - Physical L-Server startup script

   For details on the rcxstorage command, refer to "1.7.13 rcxstorage" of the "Reference Guide (Resource Management) CE".

   - Create these scripts in units of operating storage.

   - These scripts can be created after executing the failover script and performing switchover to the standby storage unit.

   - These scripts are created based on the configuration information at the time which the command is executed. When changing configurations, create these scripts again.

   - Execute the rcxstorage command with the -failback option, when an operating and a standby storage unit are displayed in the storage tree. These scripts cannot be created when the operation target storage unit is not displayed in the storage tree.

7. Execute the physical L-Server stopping script on the server where the manager is being operated. This operation stops the physical L-Server targeted by the failback script. To forcibly stop the server without shutting down the operating system running on the L-Server, specify the -force option when executing the physical L-Server stopping script.

   If an error occurs during execution of the script, contact Fujitsu technical staff.

Note

Physical L-Servers are stopped in the order of the entries in the physical L-Server stopping script. When specification of the order of stopping physical L-Servers is necessary, edit the physical L-Server stopping script.

8. Delete the zoning combining the WWPN of the HBA of the physical L-Server and the WWPN of the port of the standby storage from the Fibre Channel switch. For ETERNUS storage, this step is not necessary as the zoning for Fibre Channel switch will be deleted by Resource Orchestrator when the failback script is executed.

9. Stop the storage replication function.

10. Execute the failback script on the server where the manager is being operated.

    - If the error "Message number 62513" occurs during script execution

    The Thin Provisioning and Thick Provisioning attributes of the operating disk resource and standby disk resource may be not the same. Check the replication definition file, and define the disk resource with the same attributes of Thin Provisioning and Thick Provisioning.

    - When an error other than the above has occurred

    Contact Fujitsu technical staff.

11. To access the operating storage, add the zoning combining the WWPN of the HBA of the physical L-Server and the WWPN of the port of the operating storage to the Fibre Channel switch. For ETERNUS storage, this step is not necessary as the zoning for Fibre Channel switch will be added by Resource Orchestrator when the failback script is executed.

12. By modifying the settings of the replication function, perform replication of the storage unit from the standby to the operating, then wait until the status of the LUNs of the standby and operating storage become equivalent.

13. Execute the physical L-Server startup script on the server where the manager is being operated. This operation starts the physical L-Server.

    If an error occurs during execution of the script, contact Fujitsu technical staff.

Note

Physical L-Servers are started in the order of the entries in the physical L-Server startup script. When the specification of the order of starting physical L-Servers is necessary, edit the physical L-Server startup script.

14. When operating an L-Platform, use the cfmg_syncdiskinfo command to reflect the information for switched disks on the L-Platform configuration information.

[Windows]

> *Installation_folder*\RCXCFMG\bin\cfmg_syncdiskinfo <RETURN>

[Linux]

/opt/FJSVcfmg/bin/cfmg_syncdiskinfo <RETURN>

For details on the cfmg_syncdiskinfo command, refer to "5.13 cfmg_syncdiskinfo (disk information synchronization)" in the "Reference Guide CE".

When dynamic LUN mirroring is used

This document explains some changes and points to note when using dynamic LUN mirroring.

Prerequisites

Refer to "3.4.2 Storage Chassis High Availability Design" in the "Setup Guide CE".

Replication of Storage Unit LUNs

If disk resources are automatically generated from virtual storage, replication may be automatically set depending on the settings in the mirroring definition file. Replication settings use REC for CCM (machine-to-machine copying, transfer mode: Stack mode), so copy groups or pairs are automatically generated. The name of the generated copy group will be the value entered in the mirroring definition file.

Replication Definition Files

When replication using CCM is set, a replication definition file can be generated by executing the rcxrepdef command.

Refer to "1.7.14 rcxrepdef" in the "Reference Guide (Resource Management) CE" for information on the rcxrepdef command.

When performing switchover from operating to standby (failover)

The procedure for switchover is the same as that for when a LUN is created in the storage unit beforehand.

📓 Note
. . . .
The disk resources created using dynamic LUN mirroring are not deleted when failover to the standby node occurs.
. . . .

📖 Information
. . . .
Start to copy using REC (transfer mode: Stack mode) for CCM for the dynamic LUN mirroring. Stop the replication function using the procedure described in step 5. in the same way as follows:

1. Use the acec suspend command by specifying the -force option to forcibly suspend the REC session.

2. Use the acec change command to change the REC transfer mode to Through mode.

3. Suspend the REC session using the acec cancel command. In this case, do not specify the -force option.
. . . .

When performing switchover from standby to operating (failback)

The procedure for switchover is the same as that for when a LUN is created in the storage unit beforehand.

14.2 Admin Server High Availability

This section explains high availability of managers.

Prerequisites for Manager Cluster Operation

For details on prerequisites for operating managers in cluster environments, refer to "3.4.3 Admin Server High Availability Design" of the "Setup Guide CE".

Manager Cluster Operation in Windows Guest Environments in Hyper-V environments

- Install an operating system and configure a domain controller on the domain controller server.

- Perform installation and configuration of the admin server.

    The following operations are necessary:

    - Primary node

        - Connection with shared storage

        - Configure BIOS

        - Install Hyper-V roles

        - Install and configure EMC Solutions Enabler (when used)

        - Add a failover clustering function

        - Create a Hyper-V virtual network

        - Create clusters

        - Prepare virtual machines

        - Register virtual machines in clusters

        - Install and configure storage management software

        - Install and configure VM management software

        - Install and configure ServerView Operations Manager and ServerView Virtual-IO Manager

        - Install the Resource Orchestrator manager

        - Setup Resource Orchestrator

    - Secondary node

        - Connection with shared storage

        - Configure BIOS

        - Install Hyper-V roles

        - Install and configure EMC Solutions Enabler (when used)

        - Add a failover clustering function

        - Create a Hyper-V virtual network

For details on the following items, refer to the Hyper-V manual.

- Install Hyper-V roles

- Add a failover clustering function

- Create a Hyper-V virtual network

- Create clusters

- Prepare virtual machines

- Register virtual machines in clusters

- Operation

    When an error occurs on a VM guest, the operation will continue if the VM guest is switched over.

 Note

....

- When performing configuration, modification, or deletion of managed server environments, such as L-Server creation, if an error occurs on VM guest, the operation may fail.

  In this case, part of the environment of the managed server may be created. Perform the operation again after deleting created environments.

- When performing L-Server creation or ETERNUS configuration information modification using ETERNUS, if an error occurs on a VM guest, ETERNUS may not be able to return from the status of processing to normal status. In this case, to restore, forcibly log on from ETERNUSmgr, then log off. In the case of ETERNUS DX60/DX80/DX90, contact Fujitsu technical staff. For details on how to restore ETERNUS, refer to the ETERNUS manual.

....

Manager Cluster Operation in Windows and Linux Environments

The settings and deletion operations described below are required for cluster operation.

For details on the settings for cluster operation and the procedure for deletion, refer to "Appendix B Manager Cluster Operation Settings and Deletion" of the "Installation Guide CE".

- Settings

  - Primary node

    - Create cluster resources

    - Copy dynamic disk files

    - Perform link settings for folders on the shared disk

    - Set folder and file access rights

    - Set access rights for the Resource Orchestrator database

    - Change the IP address set for the manager's admin LAN

    - Register service resources

    - Start the cluster service

  - Secondary node

    - Perform link settings for folders on the shared disk

    - Set access rights for the Resource Orchestrator database

    - Change the IP address set for the manager's admin LAN

    - Start the cluster service

- Deletion

  - Primary node

    - Stop the cluster service

    - Delete service resources

    - Uninstall the manager

  - Secondary node

    - Uninstall the manager

    - Delete shared disk files

    - Delete cluster resources

Note

- If switchover of an admin server occurs while L-Servers are operating, the operation being performed may fail.

  If you were creating or registering resources, delete unnecessary resources and then perform the operation again.

- When performing L-Server creation or ETERNUS configuration information modification using ETERNUS, if an error occurs on an admin server, ETERNUS may not be able to return from the status of processing to normal status. In this case, to restore, forcibly log on from ETERNUSmgr, then log off. In the case of ETERNUS DX60/DX80/DX90, contact Fujitsu technical staff. For details on how to restore ETERNUS, refer to the ETERNUS manual.

Chapter 15 Disaster Recovery

This chapter provides information on Disaster Recovery for the admin server where Resource Orchestrator manager operates.

Resource Orchestrator provides simple and highly reliable Disaster Recovery, through exporting and importing the following information that Resource Orchestrator manager handles:

- L-Platform Templates

- L-Platform configuration information

- Resource information

- Accounting information

- Metering log

Prerequisites for Configuring Disaster Recovery Environments

For details on prerequisites when configuring Disaster Recovery environments, refer to "3.4.4 Disaster Recovery Design" of the "Setup Guide CE".

15.1 Installation

This section explains the installation of a Disaster Recovery environment.

Install a Disaster Recovery environment using the following flow.

1. Pre-setup Preparations

    Perform pre-setup preparations for the primary and backup sites.
    For details, refer to "Chapter 3 Resource Orchestrator Setup Design" of the "Setup Guide CE".

    - Replication of Storage Units

        Copy the primary site information to the backup site using the storage unit replication function.

        For storage replication, use the functions of "14.1.3 Storage Chassis High Availability".
        Disaster Recovery can be operated on LUNs created beforehand or on dynamic LUN mirroring storage of ETERNUS. For details on prerequisites for storage replication, refer to "3.4.2 Storage Chassis High Availability Design" of the "Setup Guide CE".

        For primary sites, it is not necessary for the disk resources for backup site to have been detected. Therefore, it is not necessary to connect storage units for the backup site to the server for the primary site.

        Configure the image file storage folder specified during installation of Resource Orchestrator on the storage of the replication target. Copy the image files stored in the image file storage folder in the same way.

        ## 📝 Note

        - When using dynamic LUN mirroring storage of ETERNUS, do not use virtual storage resources. If virtual storage resources are used, the importing performed for switchover in Disaster Recovery will fail.

        - When using dynamic LUN mirroring storage of ETERNUS, replacing by LUN which was made beforehand when changing to the backup site once from the primary site. It is necessary to build environment of replication of LUN made beforehand after that.

        - When an error occurs in the middle of transmission of online data using the replication functions of storage units, the system may not recover correctly depending on the status of data.
          Also, perform backup of the primary site regularly.

    - For directory service configuration

        When using directory services, configure the same settings for the primary and backup sites.

- When creating physical L-Servers

  Refer to "Appendix D Design and Configuration when Creating a Physical L-Server" of the "Setup Guide CE.

- When using server virtualization products to create L-Servers

  Refer to "4.4.2 Settings for Server Virtualization Software" of the "Setup Guide CE". Installation of VM management software on the backup site is not necessary because it is installed on physical L-Servers on the primary site.

- When using VMware virtual L-Servers

  Enter the following commands for the VM host and disable detection of the copied LUNs.

  > **esxcfg-advcfg -s 0 /LVM/DisallowSnapshotLUN** <RETURN>

- When using the auto-configuration function for network devices

  Copy the files and folders below to the backup site.

  Installation_folder\SVROR\Manager\etc\customize_data\network_device_model.xml
  Installation_folder\SVROR\Manager\etc\scripts\

2. Installation

   Install Resource Orchestrator on the primary and backup sites.
   For details, refer to "Chapter 5 Installation/Uninstallation" of the "Setup Guide CE".

   When you change from the primary site to the backup site repeatedly, it is necessary to change the host name of a manager server every time. In addition, it is not possible to reuse a host name that you have used.

   When Disaster Recovery is used, the license for the "DR option" is necessary.
   After installing Resource Orchestrator, register the license for the "DR option" on the primary and backup site.
   For details on how to register the license, refer to "7.1 Login" in the "Setup Guide CE".

3. Setup

   Set up Resource Orchestrator on the primary and backup site.
   For details, refer to "Chapter 8 Setup" of the "Setup Guide CE".

   For Disaster Recovery environments, configure as follows.

   - Configure the same values for the following tuning parameters of the primary and backup sites:

     Installation_folder\SVROR\Manager\rails\config\rcx\vm_guest_params.rb

     For details on settings of tuning parameters, refer to "When a Virtual L-Server is Stopped, "Message number 69122" is Displayed, and Stopping of the L-Server Fails." of "4.4 General Operations for L-Servers" of the "Reference Guide (Resource Management) CE".

   - It is necessary to register the same resource name in the server tree and the network devices tree, and the same management software name in the management software tree for the primary and backup sites.

   - When you adopt automatic IP address allocation and server selection from a server pool for L-Server, it is necessary that the IP addresses that are used for servers in the primary site are assigned to eliminate overlap with the ones of servers in the backup site.

   - It is necessary to set the same IP address for the IP address of the admin LAN used by the admin server on the primary and backup site.

   - Regarding the following configurations, use the information satisfying the necessities of both the primary and backup site.

     Installation_folder\SVROR\Manager\etc\storage\emc
     Installation_folder\SVROR\Manager\etc\customize_data\storage_portset.rcxprop

     Under *Installation_folder*\Manager\etc\customize_data\fc_connection_pattern

   - When using a virtual L-Server, it is necessary to operate the following respectively:

     - The server to operate VM management software on the physical L-Server

     - VM hosts

- It is recommended to use simple names for resources to manage in order to understand the relation of resource names of the primary and backup site easily.

- Certificates installed on both the primary and backup sites must be the same. When installing a manager on the backup site, copy the following files from the primary site. Perform this operation after stopping the manager.
  When configuring a single backup site to inherit multiple primary sites, copy the following files of the manager on the primary site that is first created to the managers on the other primary sites.

  Installation_folder\SVROR\Manager\etc\opt\FJSVssmgr\current\certificate
  Installation_folder\SVROR\Manager\etc\opt\FJSVrcxdm\certificate
  Installation_folder\SVROR\Manager\sys\apache\conf\ssl.crt
  Installation_folder\SVROR\Manager\sys\apache\conf\ssl.key

  The access rights that were modified on the primary site are not carried over to the backup site. Update them manually when the switchover has completed.

4. Configure the server NIC definition

   When using a NIC other than one in the default configurations of network auto-configuration and using a blade server, create a server NIC definition, and reflect it on the manager.
   Create the same server NIC definition for the backup site same as for the primary site in advance, and reflect it on the manager.
   Execute the rcxadm nicdefctl commit command, and reflect the created server NIC definition on the manager.

   For details on the server NIC definition, refer to "2.11 Server NIC Definitions" of the "Reference Guide (Resource Management) CE".

   For details on the rcxadm nicdefctl commit command, refer to "1.7.16 rcxadm nicdefctl" in the "Reference Guide (Resource Management) CE".

15.2 Normal Operation

This section describes the work done in the normal operation of Disaster Recovery.

1. Deployment of L-Platform, etc.

   If there is updating on the main site, such as resource configuration information to do with an L-Platform deployment, for example, do the following to collect the information for Disaster Recovery switching.

2. Export the required information from the main site

   As a backup in case of a failure in the main site, and where an environment has been constructed on the backup site that can be used for recovery, export the information as explained below.

   - L-Platform template

   - L-Platform configuration information

   - Resource information

   - Accounting information

   - Metering log

   The following operations are recommended.

   - When changing the managed server configuration, export the information first, and maintain the latest system information

   - Export regularly, and update the data

   The procedures for exporting the different pieces of information are as following.

   a. Export the resource configuration information and user definition information (XML file).
      Execute the rcxadm config export command to export Resource Configuration Information and User Definition Information (XML files).
      For details on the rcxadm config export command, refer to "1.7.11 rcxadm config" in the "Reference Guide (Resource Management) CE".

b. Exports the L-Platform template and the L-Platform configuration information.
Execute the cfmg_exportconfig command to export the L-Platform template and the L-Platform configuration information. Refer to "5.9 cfmg_exportconfig (Export Configuration Information)" in the "Reference Guide CE" for information on the cfmg_exportconfig command.

c. Exports the accounting information.
To export accounting information, execute the productmaintain export feature of the product maintenance command.
For details on the command for the maintenance of the product master, refer to "3.4 productmaintain (Product Master Maintenance)" in the "Reference Guide CE".

d. Output metering logs.
For details on the command for the maintenance of the product master, refer to "3.4 productmaintain (Product Master Maintenance)" in the "Reference Guide CE".
Refer to "3.1 ctchg_getmeterlog (Output Metering Logs)" in the "Reference Guide CE" for information on the metering log output.

e. Back up directory service information
Backs up the directory service information.

📑 Note
....

Do not export the information listed earlier at the same time as operations that modify that information, such as the deploying, returning, or modifying of L-Platforms.
....

3. Back up firewall configurations

When configuring a firewall automatically using the auto-configuration function for network devices, it is recommended to use the network device configuration backup command or the management software configuration backup function, and operate as follows:

- After configuring auto-configuration of the firewall, back up the configuration and collect the newest configuration.

- Back up firewall configurations regularly.

When backing up the configurations of firewalls regularly, collect the configuration immediately after collecting resource configuration information and user definition information (XML files), and back up at the same time.

4. Back up Execution information in sample scripts

When using the rulesets of sample scripts for firewall auto-configuration with the network device auto-configuration function, the file storing the information required to execute scripts will be backed up in the following folder:

Installation_folder\SVROR\Manager\var\lserver_repair\ruleset_backup

Back up information under the control of the above-mentioned folder after exporting various information on the primary site.

The above-mentioned folder might been changed by the parameter set to the following tuning parameter file.

When changing the destination folder, configure the following parameter in the tuning parameter file:

Tuning Parameter File

Installation_folder\SVROR\Manager\etc\customize_data\manager_backup.rcxprop

Tuning Parameter Format

```
Storage destination folder for the execution information file in ruleset_backup_dir=sample scripts
```

5. Acquire the storage replication information

Check the corresponding LUNs used to perform storage unit replication for the primary and backup sites.
Create a replication definition file which describes LUN relations. When using dynamic LUN mirroring storage of ETERNUS, since the target LUNs to be replicated are added by the deployment of L-Platforms, create the replication definition file using the rcxrepdef command. Specify that file and create the file to perform mapping of LUNs in the backup site resources from the relation lists during import.

To create this file, execute the rcxstorage command with the -recovery and -mode options. Specify "prepare" for the -mode option.

For details on replication definition files, refer to "Replication Definition Files" in "14.1.3 Storage Chassis High Availability".
For details on the rcxrepdef command, refer to "1.7.14 rcxrepdef" in the "Reference Guide (Resource Management) CE".
For details on the rcxstorage command, refer to "1.7.13 rcxstorage" of the "Reference Guide (Resource Management) CE".

15.3 Switchover Operations when Damaged

This chapter explains the procedure for switchover operations in a Disaster Recovery environment when the system has been damaged.

When you change from backup site to operation site, you can switchover same operations.

Use the following procedure for the switchover in a Disaster Recovery environment:

1. Edit resource configuration information and user definition information (XML files)

   Commands must be used to edit the Resource Configuration Information and User Definition Information (XML files), such as dividing into units for import or changing resource information to match the backup site environment.

   Use the following procedure to edit the configuration information.

   a. Separating an L-Server linked with a configured physical server

      L-Servers linked to configured physical servers cannot be restored using Disaster Recovery.
      After performing the following operations, execute the command to create a link with an L-Server. Once the restoration is complete, create a link with the L-Server again.

      > **rcxadm config filter -convert -indir** *indir* **-outdir** *outdir* <RETURN>

      The following information will be output to *outdir*, using the file name convert.txt.

      After completing the restoration procedure, perform creation of a link with an L-Server and setting the scope again as shown below:

      ```
      [command]
      rcxadm lserver convert -with BX900_1 -name physical_lserver_1
      rcxadm lserver convert -with BX900_3 -name physical_lserver_2 -to /tenant_1
      rcxadm lserver convert -with BX900_6 -name physical_lserver_3 -label test_label3 -comment
      test_comment3 -to /folder_1
      [user]
      user_1, physical_lserver_1
      user_1, /tenant_1/physical_lserver_2
      user_2, /folder_1/physical_lserver_2
      [usergroup]
      usergroup_1, physical_lserver_1
      usergroup_2, /folder_1/physical_lserver_3
      ```

   b. Mapping of storage

      Create files to perform mapping of the storage information of the backup site from the storage replication information created in step 7. of "15.1 Installation".
      For mapping file creation, execute the rcxstorage command with the -recovery and -mode options. Specify "mapping" for the -mode option.
      For details on the rcxstorage command, refer to "1.7.13 rcxstorage" of the "Reference Guide (Resource Management) CE".

      Change the storage information of the Resource Configuration Information and User Definition Information (XML files) of Resource Orchestrator imported using the created mapping files. Execute the rcxadm config map command to change the storage information.
      For details on the rcxadm config map command, refer to "1.7.11 rcxadm config" in the "Reference Guide (Resource Management) CE".

> **Note**
>
> Storage using the ETERNUS dynamic LUN mirroring is switched to the LUN that was prepared on the backup site when the switch operation is performed after a disaster. Operation may be different if the storage is not released even after deleting the L-Platform.

   c. Division of Tenant Units

When operating after creating tenants, it is necessary to divide the Resource Configuration Information and User Definition Information (XML files) to import for Resource Orchestrator into information common among tenants and information unique to each tenant. Execute the rcxadm config filter command to divide Resource Configuration Information and User Definition Information (XML files) relating to tenants for Resource Orchestrator.
For details on the rcxadm config filter command, refer to "1.7.11 rcxadm config" in the "Reference Guide (Resource Management) CE".

When switchover operation each tenant with damaged

- Resources shared between tenants

  Execute the command with the -global option specified.

- Resources of individual tenants

  Execute the command for each tenant, with the -tenant option specified. Resource Configuration Information will be divided for each tenant.

When switchover operation managed server with damaged
Execution of the rcxadm config filter command is unnecessary because dividing is unnecessary.

   d. Division of virtual L-Servers and physical L-Servers

When operating using a virtual L-Server, the virtual L-Server must be restored after restoring the physical L-Server that VM management software is mounted on. Therefore, it is necessary to divide the virtual L-Server-related resources and other resources. Regarding virtual L-Server division, perform the operation in the following environments:

- Environments not using tenants

- Environments shared between tenants divided in step c.

- Environments for individual tenants

Use the rcxadm config filter command for this operation.
For details on the rcxadm config filter command, refer to "1.7.11 rcxadm config" in the "Reference Guide (Resource Management) CE".

2. Stop operation of the backup site

When using other operations on the backup site, stop the L-Platform operations and delete the L-Platform information and the following resources used by each L-Platform.

- L-Platform template

- L-Platform configuration information

- Resource information

- Accounting information

- Metering log

The procedures for deleting the different pieces of information are as following.

   a. Delete the configuration information of resource management.

The deletion of the configuration information of the resource management stops the business of L-Platform, and deletes the resource of the following resource managements used with the L-Platform deletion and each L-Platform for management.

- L-Server

- L-Server Templates

- Tenant Folders

- Resource Folders

- Resource Pool

- Image resource

- Users

- User Groups

- Network resource

- Address Set resource

> 📝 **Note**
>
> It is not possible to delete all resource pools for backup sites. Ensure that at least one resource remains in the resource pool specifically for the backup site, and ensure that its name does not overlapping with the names of the primary site and other resource pools.
>
> This resource pool is not required after the import. Delete the resource pool when switchover operations after damage are completed.
>
> Ensure there is at least one user remaining, such as an infrastructure administrator or a dual-role administrator, to perform import operations. When using the same user name as a remaining user on the primary site, settings for the backup site are valid even after import. For instance, the password will not change to the password used in the primary site. The password originally used in the backup site can be used.

b. Delete metering log information.

Execute the ctchg_deletemeterlog as follows to delete the metering log information.

1. Modify the following configuration file for metering log operations:

File	Windows	*Installation_folder*\RCXCTMG\Charging\conf\metering_log.properties
	Linux	/opt/FJSVctchg/conf/metering_log.properties
Changes		retention_period=0000-00-00

2. Execute the ctchg_deletemeterlog command.

For details on the ctchg_deletemeterlog command, refer to "3.2 ctchg_deletemeterlog (Delete Metering Logs)" in the "Reference Guide CE".

3. Restore the settings in the operation settings file for the metering log that were changed in 1.

The default is retention_period=0000-03-00.

3. Disconnect the storage

Stop the storage replication function, and disconnect the backup site from the primary site.

4. Copy firewall configurations

When using the firewall auto-configuration function for network devices, copy the newest configuration from the primary site to the firewall of the backup site.

5. Copy execution information files of sample scripts

Copy information backed up on the operation site under the control of the following folders of the backup site.

Installation_folder\SVROR\Manager\etc\scripts

Refer to "Backup of execution information in the sample script" of "15.2 Normal Operation" for information backed up on the primary site.

6. Modify the server NIC definition

When the server NIC definition has been changed and reflected on the manager on the primary site, change the server NIC definition on the backup site, and reflect it on the manager.
Execute the rcxadm nicdefctl commit command, and reflect the modified server NIC definition on the manager.

For details on the server NIC definition, refer to "2.11 Server NIC Definitions" of the "Reference Guide (Resource Management) CE".

For details on the rcxadm nicdefctl commit command, refer to "1.7.16 rcxadm nicdefctl" in the "Reference Guide (Resource Management) CE".

7. Import appropriate information and start L-Servers

Import the Resource Configuration Information and User Definition Information (XML files) for the backup site. Manually start the created L-Platform using the import operation, as it has been stopped.

> **Note**
> ....
>
> - When this procedure are done, refer the note in "section 2 a" and delete the resource pools that were not deleted yet.
>
> - When importing resource configuration information and user definition information by executing rcxadm config import. As not all resources are registered after testing, only some resources may be registered. In this case, import again after dealing with the cause of failures.
>   When executing import, the following are automatically performed.
>
>   - Resource folder creation (tenant folders)
>
>   - Resource pool creation
>
>   - Registration of resources in resource pools
>
>   - L-Server template creation
>
>   - System image information creation
>
>   - Snapshot information creation
>
>   - L-Server creation
>
>   - Firewall creation
>
>   - User group creation
>
>   - User creation
>
> - Operate importing of the resource configuration information and user definition information (XML file) at the same time as operating it so as not to execute it the change of the resource configuration information and user definition information (XML file) such as making L-Server.
>
> - Importing may fail when switchover is performed to the backup site, due to a VM guest switchover failure. In this case, perform the import again using the following procedure, but excluding the managed servers for which import failed.
>   The following shows an example of where the VM guest could not be restored during L-Server import.
>
>   a. An error has occurred during import.
>
>     ```
>     >rcxadm config import -dir dir1 <RETURN>
>     FJSVrcx:ERROR:62569:/tenant1/l-platform1/l-server1:lserver:import was
>     interrupted. Message=:67154: VM Guest not found
>     ```
>
>   b. The status of the relevant resources is displayed to help determine the cause of the error.
>
>     ```
>     >rcxadm config show -type lserver -name /tenant1/l-platform1/l-server1 -dir
>     dir1 -format xml<RETURN>
>     ```
>
>   c. Delete the resource where the problem occurred from the export file.

```
>rcxadm config filter -exclude lserver -name /tenant1/l-platform1/l-server1 -
indir dir1 -outdir dir2 <RETURN>
```

d. Import again.

```
>rcxadm config import -dir dir2 <RETURN>
```

Procedure for Importing All Resources

a. Import the resource configuration information and user definition information (XML file).
Execute the rcxadm config import command to import Resource Configuration Information and User Definition Information (XML files).
For details on the rcxadm config import command, refer to "1.7.11 rcxadm config" in the "Reference Guide (Resource Management) CE".

When using virtual L-Servers

1. Execute import of resources other than virtual L-Servers.

The imported L-Server is in the status where it has only been defined.

2. Start the imported L-Server.

Start a physical L-Server with VM management software mounted and a physical L-Server with a VM host mounted. There are no problems starting other L-Servers after performing step e.

3. Register VM management software in the resource tree if necessary.

It is not necessary to registration again, when registration has already been performed on another tenant, sharing VM management software with other tenants. When registering VM management software, register using the same name as that of the primary site.

4. Update VM management software information, and reflect the information.

Execute the rcxadm vmmgr command to update the VM management software information.
For details on the rcxadm vmmgr command, refer to "1.7.3 rcxadm vmmgr" of the "Reference Guide (Resource Management) CE".

5. Import resources related to virtual L-Servers.

The imported L-Server is in the status where it has only been defined.

When import is executed, a test of whether importing for the Resource Configuration Information and User Definition Information (XML files) is available or not is performed. If available, an L-Server is created, then the resources allocated, and the L-Server is ready for use.

b. Deletes the L-Platform template and the L-Platform configuration information.
Execute the cfmg_deleteconfig command to delete the L-Platform template and the L-Platform configuration information.
Refer to "5.11 cfmg_deleteconfig (Delete All Configuration Information)" in the "Reference Guide CE" for information on the cfmg_deleteconfig command.

c. Imports the L-Platform template and the L-Platform configuration information.
Execute the cfmg_importconfig command to import the L-Platform template and the L-Platform configuration information.
For details on the cfmg_importconfig command, refer to "5.10 cfmg_importconfig (Import Configuration Information)" in the "Reference Guide CE".

d. Imports the accounting information.
To import accounting information, execute the productmaintain import feature of the product maintenance command.
For details on the command for the maintenance of the product master, refer to "3.4 productmaintain (Product Master Maintenance)" in the "Reference Guide CE".

e. Restores the directory service information.
Restores the directory service information.

Procedure for Importing Resources for Each Tenant

a. Copy global resources.

Import the resource configuration information and user definition information (XML file).
Execute the rcxadm config import command to import Resource Configuration Information and User Definition Information (XML files).
For details on the rcxadm config import command, refer to "1.7.11 rcxadm config" in the "Reference Guide (Resource Management) CE".

When you registered the servers that are used either by VM host constructed on physical L-Servers or by VM management software into a global pool

1. Execute import of resources other than virtual L-Servers.

   The imported L-Server is in the status where it has only been defined.

2. Start the imported L-Server.

   Start a physical L-Server with VM management software mounted and a physical L-Server with a VM host mounted. There are no problems starting other L-Servers after performing step e.

3. Register VM management software in the resource tree if necessary.

   It is not necessary to registration again, when registration has already been performed on another tenant, sharing VM management software with other tenants. When registering VM management software, register using the same name as that of the primary site.

4. Update VM management software information, and reflect the information.

   Execute the rcxadm vmmgr command to update the VM management software information.
   For details on the rcxadm vmmgr command, refer to "1.7.3 rcxadm vmmgr" of the "Reference Guide (Resource Management) CE".

b. Deletes the L-Platform template and the L-Platform configuration information.
   Execute the cfmg_deleteconfig command to delete the L-Platform template and the L-Platform configuration information.
   Refer to "5.11 cfmg_deleteconfig (Delete All Configuration Information)" in the "Reference Guide CE" for information on the cfmg_deleteconfig command.

c. Import global resource.
   Import the global L-Platform template and L-Platform configuration information.
   The L-Platform template of global and importing of the L-Platform configuration information are executed specifying to the cfmg_importconfig command "-global" optional.
   For details on the cfmg_importconfig command, refer to "5.10 cfmg_importconfig (Import Configuration Information)" in the "Reference Guide CE".

d. Imports the accounting information.

   Execute the command for the maintenance of the product master as in the case of the procedure explained in "Procedure for Importing All Resources".

e. Restores the directory service information.

   When tenants in the backup site requires to use the user accounts for the tenants that are not switched over from the primary site, delete these accounts first from directory service.

f. Import tenant resource.

   The following procedures are executed to each importing tenant.

   Execute the rcxadm config import command to import Resource Configuration Information and User Definition Information (XML files).

   When you registered the servers that are used either by VM host constructed on physical L-Servers or by VM management software into local pools in tenants

   1. Execute import of resources other than virtual L-Servers.

      The imported L-Server is in the status where it has only been defined.

2. Start the imported L-Server.

   Start a physical L-Server with VM management software mounted and a physical L-Server with a VM host mounted. There are no problems starting other L-Servers after performing step e.

3. Register VM management software in the resource tree if necessary.

   It is not necessary to registration again, when registration has already been performed on another tenant, sharing VM management software with other tenants. When registering VM management software, register using the same name as that of the primary site.

4. Update VM management software information, and reflect the information.

   Execute the rcxadm vmmgr command to update the VM management software information.
   For details on the rcxadm vmmgr command, refer to "1.7.3 rcxadm vmmgr" of the "Reference Guide (Resource Management) CE".

When using virtual L-Servers

   Import resources related to virtual L-Servers.

   The imported L-Server is in the status where it has only been defined.

g. Imports the tenant's L-Platform template and the L-Platform configuration information.

   To import the global L-Platform template and the L-Platform configuration information, execute the cfmg_importconfig command with the -tenant option.

   For details on the cfmg_importconfig command, refer to "5.10 cfmg_importconfig (Import Configuration Information)" in the "Reference Guide CE".

8. Check the imported L-Platforms

   When an L-Platform is exported during its deployment or a reconfiguration and then the L-Platform configuration information is imported using cfmg_importconfig, L-Platform information without resources may be recovered.
   In this case, information of the L-Platform whose resources may not exist is output to the log.

   Confirm the details output in logs, and take corrective action.

   For information on the content output to the log and the actions, refer to "1.2 Log Output of Disaster Recovery Commands" in the "Reference Guide CE".

9. Update the operation status

   Updates the configuration information used for collecting performance information.

   Execute the cmdbrefresh command with the "-a" and "-q" options to update the configuration information used for collecting performance information.

   For details on the cmdbrefresh command, refer to "5.12 cmdbrefresh (Refresh Configuration Information of System Condition)" in the "Reference Guide CE".

📒 Note
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As the performance information (the information displayed in the dashboard and in operational status displays) depends on the configuration of the main site, this is not carried over to the backup site when switched. The information on the backup site is displayed. The information on the backup site is displayed.
. . . .

10. Merge metering logs

   Accounting calculations can be made by merging the metering log exported from the main site and the metering log obtained (exported) from the backup site after the system is restored.

📒 Note
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Keep the metering log in its most recent condition as a backup so that the amount of information lost is limited when a fatal error occurs to the system, such as when a disaster occurs.
. . . .

11. Start L-Servers

As the power status of the imported L-Server is off, perform the following procedure to turn the power of the necessary servers on.

- Physical L-Servers created by infrastructure administrators can be started using the rcxadm folder start command or the rcxadm lserver start command.

- When the L-Server belongs to an L-Platform, power on it using the StartLServer command or the StartLPlatform command.

Appendix A Notes on Operating ServerView Resource Orchestrator

This appendix provides important reminders for the operation of Resource Orchestrator.

Redundancy Configurations for the Admin LAN

If communication issues occur on the admin LAN, or one of the network interfaces used by a managed server on the admin LAN fails, the following operations may result in errors. In such cases, restore the admin LAN network as quickly as possible.

- Backup and restore operations

- Collection and deployment of cloning images

- Server switchover and failback

HBA address rename

- With Resource Orchestrator, the factory-set WWN of a managed server's HBA is overridden when the HBA address rename function is used. The WWN is reset to its factory-set value when the server is deleted from Resource Orchestrator.
  Before using HBAs in an environment that is not managed by Resource Orchestrator, first delete the server in which it is mounted using the ROR console.
  For details on how to delete a server, refer to "5.2 Deleting Managed Servers" of the "User's Guide for Infrastructure Administrators (Resource Management) CE".

- The WWN of a managed server is set during startup, using a network boot session to connect to the admin server. Once set up with a proper WWN, the managed server reboots into its own Operating System.
  Therefore, a managed server may reboot during its startup.

- Do not move HBAs whose HBA address rename settings have been set up to different managed servers. If operating HBAs without resetting their WWNs, when the same WWN is configured on multiple servers data may be damaged by same volume access.

Changing the Manager's System Time

When the admin server's system time is reset to a time in the past, the resource monitoring by the manager stops for this period. To reset the system time to more than just a few minutes in the past, return the time and then restart the manager.
For details on how to restart the manager, refer to "7.2 Starting and Stopping the Manager" of the "Setup Guide CE".

Restarting Managers

By default, the manager services restart at 3:45 am everyday for stable system operation.

The settings for restarting can be changed depending on the authority level. To change the configuration, perform the following:

- Configuration file

  [Windows]
  Installation_folder\Manager\rails\config\rcx\rcx_manager_params.rb

  [Linux]
  /opt/FJSVrcvmr/rails/config/rcx/rcx_manager_params.rb

- Configuration Parameters

  Table A.1 Configuration Parameters

Parameter	Meaning	Initial Value
RESTART_ENABLE	Select the restart operation status.	true

Parameter	Meaning	Initial Value
	- When restarting Specify "true". - When not restarting Specify "false".	
RESTART_HOUR	Specify the restart time (hour) from 0 to 23.	3
RESTART_MIN	Specify the restart time (minutes) from 0 to 59.	45
RESTART_CYCLE	Specify the restart interval (days) from 1 to 5.	1

- Parameter change procedure

    1. Stop the manager.

    2. Use an editor and change the parameters of the rcx_manager_params.rb file.

    3. Start the manager.

For details on how to start and stop the manager, refer to "7.2 Starting and Stopping the Manager" of the "Setup Guide CE".

Note

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The conditions for restarting are, that more than RESTART_CYCLE * 24 hours have passed since manager was started and it is the time specified for RESTART_HOUR and RESTART_MIN.

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Changing Multiple Operations of Managers

When executing multiple operations simultaneously, the upper limit is set for the number of simultaneous operations.

The upper limit of the number of simultaneous operations can be changed depending on the usage environment. To change the configuration, edit the following definition file.
When there is no definition file, create one.

Location of the Definition File

[Windows]
Installation_folder\Manager\etc\customize_data

[Linux]
/etc/opt/FJSVrcvmr/customize_data

Definition File Name

rcx_base.rcxprop

Definition File Format

Describe the definition file in individual lines as below:

Key = *Value*

Definition File Items

Specify the following items:

Table A.2 Definition File Items

Items	Key	Value	Remarks
Multiplicity	TASK_WORKER_COUNT	Specify 5 - 30.	The default value is "30". For basic mode, the default value is "5".

Items	Key	Value	Remarks
			Operates by default, when there are no definition files.

Example Definition File

An example definition file is given below. Configure the multiple operations as "10" in the following examples.

```
TASK_WORKER_COUNT=10
```

Changing Procedures of Definition Files

- When using a single manager

    1. Stop the manager.

    2. Change TASK_WORKER_COUNT values for rcx_base.rcxprop files.

       When there is no rcx_base.rcxprop file, create one.

    3. Start the manager.

- When using managers in cluster environments

    [Windows]

    1. Stop the manager.

    2. Bring the shared disks of the manager online. Take cluster resources other than shared disks offline.

    3. Change the TASK_WORKER_COUNT values for rcx_base.rcxprop files on the shared disk. When there is no rcx_base.rcxprop file, create one.

       Drive_name\Fujitsu\ROR\SVROR\customize_data\rcx_base.rcxprop

    4. Start the manager.

    [Linux]

    1. Stop the manager.

    2. Mount the shared disk of the admin server on the primary node or the secondary node.

    3. Change the TASK_WORKER_COUNT values for rcx_base.rcxprop files in the shared disk.

       When there is no rcx_base.rcxprop file, create one.

       Destination_to_mount_shared_disk/Fujitsu/ROR/SVROR/etc/opt/FJSVrcvmr/customize_data/rcx_base.rcxprop

    4. Unmount the shared disk of admin server from the node mounted in 2.

    5. Start the manager.

For details on how to start and stop the manager, refer to "7.2 Starting and Stopping the Manager" of the "Setup Guide CE".

📝 **Note**

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Advisory Notes for Basic Mode

When changing multiple operations, the memory capacity to be used will increase.
For the increase in the amount of memory used, refer to "Table A.3 Increased Memory Use with Multiple Operations".
Calculate the memory used from a value in the table and the memory size required for the manager operations described in "1.4.2.6 Memory Size" of the "Setup Guide CE", and then add memory if necessary.

Table A.3 Increased Memory Use with Multiple Operations

Multiplicity	Increase in Memory Use (Unit: MB)
5	-

Multiplicity	Increase in Memory Use (Unit: MB)
6 - 14	1080 + (*Multiplicity* * 40)
15 - 30	2104 + (*Multiplicity* * 40)

A.1 Customizing Access Authority for L-Platform Operations

Authorization (access authority) to operate the L-Platform Management window can be customized in accordance with the user role (tenant administrator, tenant user).

Operations for the L-Platform Management window, from which access authority can be customized, are as follows.

- L-Platform subscription

- L-Platform cancellation

- L-Platform reconfiguration

- Server startup / shutdown

- Take, restore and deletion of virtual server snapshots

- Event log reference

- Image collection

- Backup, restore and deletion of physical servers

- Firewall settings

The access authority customize commands are used to customize access authority. Refer to "Chapter 4 Access Authority Customize Commands" in the *Reference Guide CE* for information on the access authority customize commands.

Appendix B Access Control by Roles

This section explains the control of access using roles.

B.1 Overview

Resource Orchestrator can limit the available operations and resources based on the user.

- Collections of possible operations

  These are referred to as roles.

- Resources that can be operated

  Theses are referred to as access scope.

Privileges can be controlled by configuring the roles and access scope based on users.

User groups are the function for executing batch management of multiple users. By configuring roles and access scopes in the same way as for users, user privileges for all users belonging to the user group can be configured as a batch operation.

For user groups, only "supervisor" is defined by default.

For the "supervisor" user group, the access scope and role of "all=administrator" are configured.
"all=administrator" is the role for administrators (administrators who are both infrastructure administrators and tenant administrators) with unlimited access scopes.

If no user group is specified when creating a user, the user group will be the same as the user who performed creation. Therefore, it is not necessary to consider the existence of user groups, when using a user within the same department.

When resource folders and resources specified in the access scope of a user and a user group are deleted, they are also deleted from the access scope and the role settings.

For details on the relations on access scope and role settings of a user and a user group, refer to "Table B.1 Relations on Access Scope and Role Settings of Users and User Groups".

Table B.1 Relations on Access Scope and Role Settings of Users and User Groups

Users	User Groups	Access Scope and Roles
Configured	Configured	User configurations are valid
Configured	Not configured	User configurations are valid
Not configured	Configured	User group configurations are valid
Not configured	Not configured	All resources are inaccessible

Directory services can be used for user and role management. For details on how to install and operate, refer to "Appendix C User Management Using Directory Service".

The following names are used for roles. For details on the detailed operation privileges for each role, refer to "Operation Scopes of Roles" in "B.2 Roles and Available Operations".

Table B.2 Role Types

Role Types	Role Names	Description
Infrastructure Administrative Role	Infrastructure administrator (infra_admin)	An infrastructure administrator manages the ICT resources of a private cloud (servers, storage, network), and OS's running on an L-Platform. An infrastructure administrator performs consolidated management of pooled ICT resources using Resource Orchestrator, confirms load status and when necessary, adds ICT resources, and performs switchover and maintenance. The role of the infrastructure administrator is cannot perform operations when L-Platforms and an L-Servers are operating. Use this role to limit the privileges of users managing the

Role Types	Role Names	Description
		infrastructure in regards to L-Platform and L-Servers, in order to prevent the accidental operation of said L-Platforms and L-Servers. The only operations that can be performed for an L-Platform, are monitoring and backup, and for an L-Server, monitoring and the operations given in "11.7 Migration of VM Hosts between Servers" of the "User's Guide for Infrastructure Administrators (Resource Management) CE". However, all operations can be performed for the other resources.
	Infrastructure operator (infra_operator)	An infrastructure operator can only monitor an L-Platform. Power operations and backup for resources in a resource pool can also be executed by an infrastructure operator.
	Infrastructure monitor (monitor)	A monitor can only monitor all resources.
Tenant Management Roles	Tenant administrator (tenant_admin)	Tenant administrators perform L-Server template management, user management of tenant users, and approval of L-Platform creation applications from tenant users. Use a tenant administrator, when another administrator manages an L-Platform, such as when performing cloud-type operations to borrow an L-Platform.
	Tenant operator (tenant_operator)	Tenant operator can only perform the following operations from the operations which tenant administrators can perform. - Resource backup - L-Platform power operation - Resource monitoring of all tenants - Tenant and local pool monitoring
	Tenant monitor (tenant_monitor)	A tenant monitor can only monitor L-Platforms and L-Servers.
Multiple Roles	Administrator (administrator)	An administrator is both an infrastructure administrator and a tenant administrator.
	Operator (operator)	An operator is both an infrastructure operator and a tenant operator.
	Monitor (monitor)	A monitor can only monitor all resources.
Tenant Use Roles	Tenant user (tenant_user)	Tenant users can create L-Platforms inside tenants. Tenant users apply to tenant administrators to create and use L-Platforms. When an application is approved and an L-Platform created, the user who applied is automatically assigned the role of L-Platform User (lplatform_user).
	L-Platform User (lplatform_user)	L-Platform User is the role to enable tenant users (tenant_user) to use L-Platforms. L-Platform users can operate, change, and delete L-Platforms. This role is automatically assigned when an L-Platform is created. When the L-Platform is deleted, the assigned role is deleted automatically. Addition and deletion is not necessary.

B.2 Roles and Available Operations

This section explains roles.

For details on how to configure roles and access scopes for users and user groups, refer to "1.6 User Operations" of the "Reference Guide (Resource Management) CE".

By specifying a combination of role and access scope for the target user or user group, the access privileges are restricted. The access scope is restricted by specifying resource folders, resource pools, or resources in the orchestration tree.

For the following users, only orchestration tree can be used since resources that can be referred are restricted. Switchover to other trees is not possible.

- Users with restricted access

- Users for which service administrative roles are configured

For details on trees, refer to "1.1 ROR Console" of the "User's Guide for Infrastructure Administrators (Resource Management) CE".

Roles are specified from the following role names:

Operation Scopes of Roles

Table B.3 Infrastructure Administrative Role

Resource Types	Operations	Operator (Role)		
		Infrastructure Administrator infra_admin	Infrastructure Operator infra_operator	Infrastructure Monitor monitor
Application Process	Approval	No	No	No
	Evaluation	Yes	No	No
L-Server/L-Platform	Creation	No	No	No
	Modification/ Movement/Deletion	No	No	No
	Power operation (Usage change) (*1)	No	No	No
	Console Screen Acquisition	No	No	No
	Snapshot/Backup	No	No	No
	Image Collection	No	No	No
	Monitoring	Yes	Yes	Yes
Maintenance of L-Servers	Migration	Yes	No	No
	Conversion/Reversion	Yes	No	No
	Modification to an L-Server for the infrastructure administrator	No	No	No
L-Server Templates	Import/Modification/ Deletion	Yes	No	No
	Export	Yes	Yes	No
	Viewing	Yes	Yes	Yes
L-Platform Templates	Create new templates	Yes	No	No

Resource Types	Operations	Operator (Role)		
		Infrastructure Administrator infra_admin	Infrastructure Operator infra_operator	Infrastructure Monitor monitor
	Copying/Modification/ Deletion	Yes	No	No
	Viewing	Yes	Yes (*4)	Yes (*4)
L-Server for infrastructure administrator	Creation/Modification/ Movement/Deletion	Yes	No	No
	Power operation (Usage change)	Yes	Yes	No
	Console Screen Acquisition	Yes	Yes	No
	Snapshot/Backup	Yes	Yes	No
	Image Collection	Yes	Yes	No
	Monitoring	Yes	Yes	Yes
Maintenance of the L-Server for the infrastructure administrator	Migration	Yes	No	No
	Modification of L-Servers	No	No	No
Resource Pool	Creation/Modification/ Movement/Deletion	Yes	No	No
	Resource registration/ deletion (*2)	Yes	No	No
	Migration of resources between resource pools	Yes	No	No
	Monitoring	Yes	Yes	Yes
Physical Server	Registration/Deletion	Yes	No	No
	Power Operations (*3)	Yes	Yes	No
	Console Screen Acquisition	Yes	Yes	No
	Maintenance Mode Settings	Yes	No	No
	Monitoring	Yes	Yes	Yes
VM Hosts	Registration/Deletion	Yes	No	No
	Power Operations	Yes	Yes	No
	Maintenance Mode Settings	Yes	No	No
	Monitoring	Yes	Yes	Yes
Storage Management Software	Creation/Modification/ Deletion	Yes	No	No
	Monitoring	Yes	Yes	Yes
Disks	Registration/Deletion (*2)	Yes	No	No
	Modification	Yes	No	No

Resource Types	Operations	Operator (Role)		
		Infrastructure Administrator infra_admin	Infrastructure Operator infra_operator	Infrastructure Monitor monitor
	Monitoring	Yes	Yes	Yes
Network	Creation/Modification/ Deletion	Yes	No	No
	Monitoring	Yes	Yes	Yes
Address	Creation/Modification/ Deletion	Yes	No	No
	Monitoring	Yes	Yes	Yes
Image	Modification	Yes	No	No
	Deletion	Yes	No	No
	Monitoring	Yes	Yes	Yes
Chassis	Creation/Modification/ Deletion	Yes	No	No
	Power Operations	Yes	Yes	No
	Monitoring	Yes	Yes	Yes
Power Monitoring Device	Creation/Modification/ Deletion	Yes	No	No
	Monitoring	Yes	Yes	Yes
Network Devices	Creation/Modification/ Deletion	Yes	No	No
	Monitoring	Yes	Yes	Yes
Network Configuration Information	Import	Yes	No	No
	Export	Yes	No	No
Server NIC Definitions	Reflect/Display	Yes	No	No
Pre-configuration	Download	Yes	No	No
Tenant Folders	Creation/Modification/ Movement/Deletion	Yes	No	No
	Monitoring	Yes	Yes	Yes
Resource Folders	Creation/Modification/ Movement/Deletion	Yes	No	No
	Monitoring	Yes	Yes	Yes
	L-Server batch power operations under resource folders	No	No	No
Users	Modification of individual information	Yes	Yes	Yes
	Addition/Modification/ Deletion of users in the user group the user belongs to	Yes	No	No

Resource Types	Operations	Operator (Role)		
		Infrastructure Administrator infra_admin	Infrastructure Operator infra_operator	Infrastructure Monitor monitor
	Addition/Modification/ Deletion of users in other user groups	Yes	No	No
	Viewing	Yes	Yes	Yes
	User registration on the manager during directory service authentication	Yes	No	No
	Release of user registration during directory service authentication	Yes	No	No
User Groups	Creation/Modification/ Deletion	Yes	No	No
	Viewing	Yes	Yes	Yes
L-Platform Templates Software Information	Creation	Yes	No	No
	Copying	Yes	No	No
	Modification/Deletion	Yes	No	No
	Viewing	Yes	Yes (*4)	Yes (*4)
L-Platform Template Image Information	Creation	Yes	No	No
	Copying	Yes	No	No
	Modification/Deletion/ Display Modification	Yes	No	No
	Viewing	Yes	Yes (*4)	Yes (*4)
L-Platform Template Segment Information	Creation	Yes	No	No
	Modification/Deletion	Yes	No	No
	Viewing	Yes	Yes (*4)	Yes (*4)
L-Platform Template Template Information	Creation	Yes	No	No
	Copying	Yes	No	No
	Modification/Deletion/ Display Modification	Yes	No	No
	Viewing	Yes	Yes (*4)	Yes (*4)

*1: Usage changes are only possible when L-Server attributes have been configured in advance.
*2: Users whose access scopes are not restricted should perform resource registration.
*3: The power operations are also available from BladeViewer.
*4: Information about L-Platform templates can only be obtained using the L-Platform API.

Table B.4 Tenant Management Roles

Resource Types	Operations	Operator (Role)		
		Tenant Administrator tenant_admin	Tenant Operator tenant_operator	Tenant Monitor tenant_monitor
Application Process	Approval	Yes (*1)	No	No
	Evaluation	No	No	No
L-Server/L-Platform	Creation	Yes	No	No
	Modification/ Movement/Deletion	Yes	No	No
	Power operation (Usage change) (*2)	Yes	Yes	No
	Console Screen Acquisition	Yes	Yes	No
	Snapshot/Backup	Yes	Yes	No
	Image Collection	Yes	Yes	No
	Monitoring	Yes	Yes	Yes
Maintenance of L-Servers	Migration	No	No	No
	Conversion/Reversion	No	No	No
	Modification to an L-Server for the infrastructure administrator	No	No	No
L-Server Templates	Import/Modification/ Deletion	No	No	No
	Export	No	No	No
	Viewing	Yes	No	No
L-Platform templates	Create new templates	No	No	No
	Copying/Modification/ Deletion	Yes (*3)	No	No
	Viewing	Yes	Yes (*6)	Yes (*6)
L-Server for infrastructure administrator	Creation/Modification/ Movement/Deletion	No	No	No
	Power operation (Usage change)	No	No	No
	Console Screen Acquisition	No	No	No
	Snapshot/Backup	No	No	No
	Image Collection	No	No	No
	Monitoring	No	No	No
Maintenance of the L-Server for the infrastructure administrator	Migration	No	No	No
	Modification of L-Servers	No	No	No
Resource Pool	Creation/Modification/ Movement/Deletion	No	No	No

Resource Types	Operations	Operator (Role)		
		Tenant Administrator tenant_admin	Tenant Operator tenant_operator	Tenant Monitor tenant_monitor
	Resource registration/deletion (*4)	Yes	No	No
	Migration of resources between resource pools	Yes	No	No
	Monitoring	Yes	Yes	No
Physical Server	Registration/Deletion	No	No	No
	Power Operations (*5)	No	No	No
	Console Screen Acquisition	No	No	No
	Maintenance Mode Settings	No	No	No
	Monitoring	Yes	Yes	No
VM Hosts	Registration/Deletion	No	No	No
	Power Operations	No	No	No
	Maintenance Mode Settings	No	No	No
	Monitoring	Yes	Yes	No
Storage Management Software	Creation/Modification/Deletion	No	No	No
	Monitoring	Yes	Yes	No
Disks	Registration/Deletion (*4)	Yes	No	No
	Modification	Yes	No	No
	Monitoring	Yes	Yes	No
Network	Creation/Modification/Deletion	No	No	No
	Monitoring	Yes	Yes	No
Address	Creation/Modification/Deletion	No	No	No
	Monitoring	Yes	Yes	No
Image	Modification	Yes	No	No
	Deletion	Yes	No	No
	Monitoring	Yes	Yes	No
Chassis	Creation/Modification/Deletion	No	No	No
	Power Operations	No	No	No
	Monitoring	No	No	No
Power Monitoring Device	Creation/Modification/Deletion	No	No	No
	Monitoring	No	No	No

Resource Types	Operations	Operator (Role)		
		Tenant Administrator tenant_admin	Tenant Operator tenant_operator	Tenant Monitor tenant_monitor
Network Devices	Creation/Modification/Deletion	No	No	No
	Monitoring	Yes	Yes	No
Network Configuration Information	Import	No	No	No
	Export	No	No	No
Server NIC Definitions	Reflect/Display	No	No	No
Pre-configuration	Download	No	No	No
Tenant Folders	Creation/Modification/Movement/Deletion	No	No	No
	Monitoring	Yes	Yes	Yes
Resource Folders	Creation/Modification/Movement/Deletion	Yes	No	No
	Monitoring	Yes	Yes	Yes
	L-Server batch power operations under resource folders	Yes	Yes	No
Users	Modification of individual information	Yes	Yes	Yes
	Addition/Modification/Deletion of users in the user group the user belongs to	Yes	No	No
	Addition/Modification/Deletion of users in other user groups	No	No	No
	Viewing	Yes	Yes	Yes
	User registration on the manager during directory service authentication	Yes	No	No
	Release of user registration during directory service authentication	Yes	No	No
User Groups	Creation/Modification/Deletion	No	No	No
	Viewing	Yes	Yes	Yes
L-Platform Templates Software Information	Creation	Yes	No	No
	Copying	Yes	No	No
	Modification/Deletion	Yes	No	No
	Viewing	Yes	Yes (*6)	Yes (*6)

Resource Types	Operations	Operator (Role)		
		Tenant Administrator tenant_admin	Tenant Operator tenant_operator	Tenant Monitor tenant_monitor
L-Platform Template Image Information	Creation	Yes	No	No
	Copying	Yes	No	No
	Modification/Deletion/ Display Modification	Yes	No	No
	Viewing	Yes	Yes (*6)	Yes (*6)
L-Platform Template Segment Information	Creation	Yes	No	No
	Modification/Deletion	Yes	No	No
	Viewing	Yes	Yes (*6)	Yes (*6)
L-Platform Template Template Information	Creation	No	No	No
	Copying	Yes	No	No
	Modification/Deletion/ Display Modification	Yes	No	No
	Viewing	Yes	Yes (*6)	Yes (*6)

*1: Tenant administrators approve L-Platform applications submitted by tenant users or other tenant administrators.
*2: Usage changes are only possible when L-Server attributes have been configured in advance.
*3: Only the data that the user copied can be changed or deleted.
*4: Users whose access scopes are not restricted should perform resource registration.
*5: The power operations are also available from BladeViewer.
*6: Information about L-Platform templates can only be obtained using the L-Platform API.

Table B.5 Tenant User

Resource Types	Operations	Tenant User tenant_user	L-Platform User lplatform_user
Application Process	Approval	No	No
	Evaluation	No	No
L-Server/L-Platform	Creation	Yes	No
	Modification/Movement/Deletion	No	Yes
	Power operation (Usage change) (*1)	No	Yes
	Console Screen Acquisition	No	Yes
	Snapshot/Backup	No	Yes
	Image Collection	No	No
	Monitoring	No	Yes
Maintenance of L-Servers	Migration	No	No
	Conversion/Reversion	No	No
	Modification to an L-Server for the infrastructure administrator	No	No
L-Server Templates	Import/Modification/Deletion	No	No
	Export	No	No
	Viewing	Yes	Yes
L-Platform Templates	Create new templates	No	No

Resource Types	Operations	Tenant User tenant_user	L-Platform User lplatform_user
	Copying/Modification/Deletion	No	No
	Viewing	Yes	Yes
L-Server for infrastructure administrator	Creation/Modification/Movement/Deletion	No	No
	Power operation (Usage change)	No	No
	Console Screen Acquisition	No	No
	Snapshot/Backup	No	No
	Image Collection	No	No
	Monitoring	No	No
Maintenance of the L-Server for the infrastructure administrator	Migration	No	No
	Modification of L-Servers	No	No
Resource Pool	Creation/Modification/Movement/Deletion	No	No
	Resource registration/deletion (*2)	No	No
	Migration of resources between resource pools	No	No
	Monitoring	Yes	Yes
Physical Server	Registration/Deletion	No	No
	Power Operations (*3)	No	No
	Console Screen Acquisition	No	No
	Maintenance Mode Settings	No	No
	Monitoring	Yes	Yes
VM Hosts	Registration/Deletion	No	No
	Power Operations	No	No
	Maintenance Mode Settings	No	No
	Monitoring	Yes	Yes
Storage Management Software	Creation/Modification/Deletion	No	No
	Monitoring	Yes	Yes
Disks	Registration/Deletion (*2)	No	No
	Modification	No	No
	Monitoring	Yes	Yes
Network	Creation/Modification/Deletion	No	No
	Monitoring	Yes	Yes
Address	Creation/Modification/Deletion	No	No
	Monitoring	Yes	Yes
Image	Modification	No	No
	Deletion	No	No
	Monitoring	Yes	Yes
Chassis	Creation/Modification/Deletion	No	No
	Power Operations	No	No

Resource Types	Operations	Tenant User tenant_user	L-Platform User lplatform_user
	Monitoring	No	No
Power Monitoring Device	Creation/Modification/Deletion	No	No
	Monitoring	No	No
Network Devices	Creation/Modification/Deletion	No	No
	Monitoring	Yes	Yes
Network Configuration Information	Import	No	No
	Export	No	No
Server NIC Definitions	Reflect/Display	No	No
Pre-configuration	Download	No	No
Tenant Folders	Creation/Modification/Movement/Deletion	No	No
	Monitoring	Yes	Yes
Resource Folders	Creation/Modification/Movement/Deletion	No	No
	Monitoring	Yes	Yes
	L-Server batch power operations under resource folders	No	No
Users	Modification of individual information	Yes	Yes
	Addition/Modification/Deletion of users in the user group the user belongs to	No	No
	Addition/Modification/Deletion of users in other user groups	No	No
	Viewing	Yes	Yes
	User registration on the manager during directory service authentication	No	No
	Release of user registration during directory service authentication	No	No
User Groups	Creation/Modification/Deletion	No	No
	Viewing	Yes	Yes
L-Platform Templates Software Information	Creation	No	No
	Copying	No	No
	Modification/Deletion	No	No
	Viewing	Yes	No
L-Platform templates Image Information	Creation	No	No
	Copying	No	No
	Modification/Deletion/Display Modification	No	No
	Viewing	Yes	No
L-Platform templates Segment Information	Creation	No	No
	Modification/Deletion	No	No
	Viewing	Yes	No
L-Platform templates Template Information	Creation	No	No
	Copying	No	No

Resource Types	Operations	Tenant User tenant_user	L-Platform User lplatform_user
	Modification/Deletion/Display Modification	No	No
	Viewing	Yes	No

*1: Usage changes are only possible when L-Server attributes have been configured in advance.

*2: Users whose access scopes are not restricted should perform resource registration.

*3: The power operations are also available from BladeViewer.

Table B.6 Multiple Roles

Resource Types	Operations	Administrator administrator	Operator operator	Monitor monitor
Application Process	Approval (*1)	Yes	No	No
	Evaluation	Yes	No	No
L-Server/L-Platform	Creation	Yes	No	No
	Modification/ Movement/Deletion	Yes	No	No
	Power operation (Usage change) (*2)	Yes	Yes	No
	Console Screen Acquisition	Yes	Yes	No
	Snapshot/Backup	Yes	Yes	No
	Image Collection	Yes	Yes	No
	Monitoring	Yes	Yes	Yes
Maintenance of L-Servers	Migration	Yes	No	No
	Conversion/Reversion	Yes	No	No
	Modification to an L-Server for the infrastructure administrator	No	No	No
L-Server Templates	Import/Modification/ Deletion	Yes	No	No
	Export	Yes	Yes	No
	Viewing	Yes	Yes	Yes
L-Platform Templates	Create new templates	Yes	No	No
	Copying/Modification/ Deletion	Yes	No	No
	Viewing	Yes	Yes (*5)	Yes (*5)
L-Server for infrastructure administrator	Creation/Modification/ Movement/Deletion	Yes	No	No
	Power operation (Usage change)	Yes	Yes	No
	Console Screen Acquisition	Yes	Yes	No
	Snapshot/Backup	Yes	Yes	No
	Image Collection	Yes	Yes	No

Resource Types	Operations	Administrator administrator	Operator operator	Monitor monitor
	Monitoring	Yes	Yes	Yes
Maintenance of the L-Server for the infrastructure administrator	Migration	Yes	No	No
	Modification of L-Servers	No	No	No
Resource Pool	Creation/Modification/Movement/Deletion	Yes	No	No
	Resource registration/deletion (*3)	Yes	No	No
	Migration of resources between resource pools	Yes	No	No
	Monitoring	Yes	Yes	Yes
Physical Server	Registration/Deletion	Yes	No	No
	Power Operations (*4)	Yes	Yes	No
	Console Screen Acquisition	Yes	Yes	No
	Maintenance Mode Settings	Yes	No	No
	Monitoring	Yes	Yes	Yes
VM Hosts	Registration/Deletion	Yes	No	No
	Power Operations	Yes	Yes	No
	Maintenance Mode Settings	Yes	No	No
	Monitoring	Yes	Yes	Yes
Storage Management Software	Creation/Modification/Deletion	Yes	No	No
	Monitoring	Yes	Yes	Yes
Disks	Registration/Deletion (*3)	Yes	No	No
	Modification	Yes	No	No
	Monitoring	Yes	Yes	Yes
Network	Creation/Modification/Deletion	Yes	No	No
	Monitoring	Yes	Yes	Yes
Address	Creation/Modification/Deletion	Yes	No	No
	Monitoring	Yes	Yes	Yes
Image	Modification	Yes	No	No
	Deletion	Yes	No	No
	Monitoring	Yes	Yes	Yes
Chassis	Creation/Modification/Deletion	Yes	No	No
	Power Operations	Yes	Yes	No

Resource Types	Operations	Administrator administrator	Operator operator	Monitor monitor
	Monitoring	Yes	Yes	Yes
Power Monitoring Device	Creation/Modification/ Deletion	Yes	No	No
	Monitoring	Yes	Yes	Yes
Network Devices	Creation/Modification/ Deletion	Yes	No	No
	Monitoring	Yes	Yes	Yes
Network Configuration Information	Import	Yes	No	No
	Export	Yes	No	No
Server NIC Definitions	Reflect/Display	Yes	No	No
Pre-configuration	Download	Yes	No	No
Tenant Folders	Creation/Modification/ Movement/Deletion	Yes	No	No
	Monitoring	Yes	Yes	Yes
Resource Folders	Creation/Modification/ Movement/Deletion	Yes	No	No
	Monitoring	Yes	Yes	Yes
	L-Server batch power operations under resource folders	Yes	Yes	No
Users	Modification of individual information	Yes	Yes	Yes
	Addition/Modification/ Deletion of users in the user group the user belongs to	Yes	No	No
	Addition/Modification/ Deletion of users in other user groups	Yes	No	No
	Viewing	Yes	Yes	Yes
	User registration on the manager during directory service authentication	Yes	No	No
	Release of user registration during directory service authentication	Yes	No	No
User Groups	Creation/Modification/ Deletion	Yes	No	No
	Viewing	Yes	Yes	Yes
L-Platform Templates Software Information	Creation	Yes	No	No
	Copying	Yes	No	No

Resource Types	Operations	Administrator administrator	Operator operator	Monitor monitor
	Modification/Deletion	Yes	No	No
	Viewing	Yes	Yes (*5)	Yes (*5)
L-Platform Template Image Information	Creation	Yes	No	No
	Copying	Yes	No	No
	Modification/Deletion/ Display Modification	Yes	No	No
	Viewing	Yes	Yes (*5)	Yes (*5)
L-Platform Template Segment Information	Creation	Yes	No	No
	Modification/Deletion	Yes	No	No
	Viewing	Yes	Yes (*5)	Yes (*5)
L-Platform Template Template Information	Creation	Yes	No	No
	Copying	Yes	No	No
	Modification/Deletion/ Display Modification	Yes	No	No
	Viewing	Yes	Yes (*5)	Yes (*5)

*1: Dual-role administrators approve L-Platform applications submitted by dual-role administrators.
*2: Usage changes are only possible when L-Server attributes have been configured in advance.
*3: Users whose access scopes are not restricted should perform resource registration.
*4: The power operations are also available from BladeViewer.
*5: Information about L-Platform templates can only be obtained using the L-Platform API.

Note

When an access scope of operation for a user or user group is limited, other users and user groups cannot perform operations from trees other than the orchestration tree. Operate resources registered in a resource pool, by selecting the resource in the resource pool after selection from the orchestration tree. To operate resources which are not registered in resource pool or resources which are unable to be registered, use a user with full operation access scope.
For details on how to configure access scopes, refer to "1.6 User Operations" in the "Reference Guide (Resource Management) CE".

Appendix C User Management Using Directory Service

This section explains how to manage users using the directory service for Basic mode.

The following directory services are related in Resource Orchestrator:

- Active Directory (Windows Server 2003 and Windows Server 2008)

- LDAP service (hereinafter OpenDS) attached to ServerView Operations Manager for Windows

- Individually configured OpenDS

- OpenLDAP V2.3 or later

C.1 Operation Method

This section explains the operation method of user management using the directory service.

It is necessary to add or change user entries on the directory service side.

For details on adding, modifying, deleting, or referring to user entries, refer to the documentation of the directory services.

Login

Users can only log in when there are users roles and access scopes are allocated in Resource Orchestrator, and the user information is in the directory service.

Add a User

Use the following procedure to add a user:

1. In the directory service, add a user.

2. After adding a user to the directory service, it is necessary to add the user to the user group and allocate a role. Refer to "9.1 Registering User Accounts" of the "User's Guide for Infrastructure Administrators (Resource Management) CE".

Change the User Password

User passwords are not included in the management information of Resource Orchestrator. Perform authentication using the user password registered in the directory service.

Use one of following cases to modify a user password.

- rcxadm user command

- ROR console

- Directory service functions

Change User ID

Use the following procedure to change the user ID.

1. In the directory service, modify the user ID (DN).

2. Use the rcxadm user command or the ROR console to change a user ID.

Delete a User

Use the following procedure to delete a user:

1. In the directory service, delete a user.

2. Confirm the directory service information is not used in the user management of other systems, and delete the information.

C.2 User Information Maintenance

This section explains how to maintain user information.

Back up and Restore the Directory Service

For details on how to perform backup and restore in the directory service including the user information, refer to the manuals of the used directory services.

After restoration, use the following procedure to reflect the user operations (user registration or user deletion) in Resource Orchestrator to the directory service.
The user password change cannot be reflected. Request an administrator of the directory service to re-configure the password.

1. Output the user list information for Resource Orchestrator.

   📝 Example
   ....
   [Windows]

   > *Installation_folder***SVROR\Manager\bin\rcxadm user list -outfile myusers.txt** <RETURN>

   [Linux]

   # **/opt/FJSVrcvmr/bin/rcxadm user list -outfile myusers.txt** <RETURN>
   ....

2. Compare the user information for directory service and the user information for Resource Orchestrator output in 1.

3. Check any users in the user information for Resource Orchestrator output in 1, who are not in the directory service.

4. Use the following procedure for the users confirmed in 3.

   a. Check the operations after the time of backup of directory service, based on the "operation time" registered in audit logs.

   b. As described in a., extract the userid relevant to the following:

      - For the operation type, there are "createUser", "updateUser", and "moveUser"

      - The last operation type is not "deleteUser"

   c. Register the users extracted in b., in the directory service.

   d. When the last operation type in b. is "deleteUser", delete the relevant users from the directory service if necessary.

   📒 Note
   ....
   Delete users, after checking that the user is not necessary for other system operations.
   ....

5. Exclude the users restored in 4. from the users checked in 3.

   Register the other users in the directory service.

6. Register an infrastructure administrator and a dual-role administrator as a reviewer for an application process from the users registered in the directory service in 5.

   For details on how to register as a reviewer for an application process, refer to "6.5.1.2 Adding an infrastructure administrator/dual-role administrator to IflowUsers Group" in the "Setup Guide CE".

7. Check any users not in the user information for Resource Orchestrator output in 1, who are in the directory service.

8. Exclude the users deleted in d. in 4. from the users checked in 7.

The other users may be an infrastructure administrator, an infrastructure operator, an infrastructure monitor, an administrator, an operator, or a monitor for Resource Orchestrator.
In the directory service, delete a user if necessary.

📝 Note

Delete the user, by checking that the user is not necessary for the other system operations.

Change the password for the directory service administrative user

Change the password for the directory service administrative user using the following procedure.

1. Change the administrative password for the directory service.

2. Execute the rcxadm authctl modify command to change the administrative user password of the directory service to be retained as the connection information.

Switchover to an Internal Authentication Function, when Stopping the Directory Service due to an Error

When the directory service is stopped due to an error, use the following procedure to perform switchover to the internal authentication function, and restoration.

1. Stop the Resource Orchestrator manager.

   For details on how to stop the manager, refer to "7.2 Starting and Stopping the Manager" of the "Setup Guide CE".

2. The directory service registration is released.

   Execute the rcxadm authctl unregister command to unregister the directory service.
   For details on the rcxadm authctl unregister command, refer to "1.7.10 rcxadm authctl" of the "Reference Guide (Resource Management) CE".

3. Start the Resource Orchestrator manager.

   For details on how to start the manager, refer to "7.2 Starting and Stopping the Manager" of the "Setup Guide CE".

4. The directory service is restored.

5. Stop the Resource Orchestrator manager.

   For details on how to stop the manager, refer to "7.2 Starting and Stopping the Manager" of the "Setup Guide CE".

6. The directory service is registered.

   Execute the rcxadm authctl register command to register the directory service.
   For details on the rcxadm authctl register command, refer to "1.7.10 rcxadm authctl" of the "Reference Guide (Resource Management) CE".

7. Start the Resource Orchestrator manager.

   For details on how to start the manager, refer to "7.2 Starting and Stopping the Manager" of the "Setup Guide CE".

Restoration When Resource Orchestrator Stops due to an Error

Use the following procedure to perform restoration after Resource Orchestrator stops due to an error:

1. Restore the backup data of Resource Orchestrator.

   For details on how to restore, refer to "Chapter 8 Backup and Restoration of Admin Servers".

2. Start the Resource Orchestrator manager.

   For details on how to start the manager, refer to "7.2 Starting and Stopping the Manager" of the "Setup Guide CE".

Glossary

---

access path

A logical path configured to enable access to storage volumes from servers.

---

active mode

The state where a managed server is performing operations.
Managed servers must be in active mode in order to use Auto-Recovery.
Move managed servers to maintenance mode in order to perform backup or restoration of system images, or collection or deployment of cloning images.

---

active server

A physical server that is currently operating.

---

admin client

A terminal (PC) connected to an admin server, which is used to operate the GUI.

---

admin LAN

A LAN used to manage resources from admin servers.
It connects managed servers, storage, and network devices.

---

admin server

A server used to operate the manager software of Resource Orchestrator.

---

affinity group

A grouping of the storage volumes allocated to servers. A function of ETERNUS.

Equivalent to the LUN mapping of EMC.

---

agent

The section (program) of Resource Orchestrator that operates on managed servers.

---

aggregate

A unit for managing storage created through the aggregation of a RAID group.

Aggregates can contain multiple FlexVols.

---

alias name

A name set for each ETERNUS LUN to distinguish the different ETERNUS LUNs.

Auto Deploy

A function for deploying VMware ESXi5.0 to servers using the PXE boot mechanism.

Automatic Storage Layering

A function that optimizes perform and cost by automatically rearranging data in storage units based on the frequency of access.

Auto-Recovery

A function which continues operations by automatically switching over the system image of a failed server to a spare server and restarting it in the event of server failure.
This function can be used when managed servers are in a local boot configuration, SAN boot configuration, or a configuration such as iSCSI boot where booting is performed from a disk on a network.

- When using a local boot configuration

  The system is recovered by restoring a backup of the system image of the failed server onto a spare server.

- When booting from a SAN or a disk on a LAN

  The system is restored by having the spare server inherit the system image on the storage.
  Also, when a VLAN is set for the public LAN of a managed server, the VLAN settings of adjacent LAN switches are automatically switched to those of the spare server.

backup site

An environment prepared in a different location, which is used for data recovery.

BACS (Broadcom Advanced Control Suite)

An integrated GUI application (comprised from applications such as BASP) that creates teams from multiple NICs, and provides functions such as load balancing.

BASP (Broadcom Advanced Server Program)

LAN redundancy software that creates teams of multiple NICs, and provides functions such as load balancing and failover.

blade server

A compact server device with a thin chassis that can contain multiple server blades, and has low power consumption.
As well as server blades, LAN switch blades, management blades, and other components used by multiple server blades can be mounted inside the chassis.

blade type

A server blade type.
Used to distinguish the number of server slots used and servers located in different positions.

BladeViewer

A GUI that displays the status of blade servers in a style similar to a physical view and enables intuitive operation.
BladeViewer can also be used for state monitoring and operation of resources.

BMC (Baseboard Management Controller)

A Remote Management Controller used for remote operation of servers.

boot agent

An OS for disk access that is distributed from the manager to managed servers in order to boot them when the network is started during image operations.

CA (Channel Adapter)

An adapter card that is used as the interface for server HBAs and fibre channel switches, and is mounted on storage devices.

CCM (ETERNUS SF AdvancedCopy Manager Copy Control Module)

This is a module that does not require installation of the ETERNUS SF AdvancedCopy Manager agent on the server that is the source of the backup, but rather uses the advanced copy feature of the ETERNUS disk array to make backups.

chassis

A chassis used to house server blades and partitions.
Sometimes referred to as an enclosure.

cloning

Creation of a copy of a system disk.

cloning image

A backup of a system disk, which does not contain server-specific information (system node name, IP address, etc.), made during cloning.

When deploying a cloning image to the system disk of another server, Resource Orchestrator automatically changes server-specific information to that of the target server.

Cloud Edition

The edition which can be used to provide private cloud environments.

data center

A facility that manages client resources (servers, storage, networks, etc.), and provides internet connections and maintenance/operational services.

directory service

A service for updating and viewing the names (and associated attributes) of physical/logical resource names scattered across networks, based on organizational structures and geographical groups using a systematic (tree-shaped structure) management methodology.

disk resource

The unit for resources to connect to an L-Server. An example being a virtual disk provided by LUN or VM management software.

DN (Distinguished Name)

A name defined as a line of an RDN, which contains an entry representing its corresponding object and higher entry.

Domain

A system that is divided into individual systems using partitioning. Also used to indicate a partition.

DR Option

The option that provides the function for remote switchover of servers or storage in order to perform disaster recovery.

Dual-Role Administrators

The administrators with both infrastructure administrator's and tenant administrator's role.

dynamic LUN mirroring

This is a feature whereby a mirror volume is generated at the remote site when a volume is generated at the local site, and copies are maintained by performing REC.

dynamic memory

A function that optimizes physical memory allocation for virtual machines, depending on their execution status on Hyper-V.

end host mode

This is a mode where the uplink port that can communicate with a downlink port is fixed at one, and communication between uplink ports is blocked.

environmental data

Measured data regarding the external environments of servers managed using Resource Orchestrator.
Measured data includes power data collected from power monitoring targets.

ESC (ETERNUS SF Storage Cruiser)

Software that supports stable operation of multi-vendor storage system environments involving SAN, DAS, or NAS. Provides configuration management, relation management, trouble management, and performance management functions to integrate storage related resources such as ETERNUS.

ETERNUS SF AdvancedCopy Manager

This is storage management software that makes highly reliable and rapid backups, restorations and replications using the advanced copy feature of the ETERNUS disk array.

Express

The edition which provides server registration, monitoring, and visualization.

FC switch (Fibre Channel Switch)

A switch that connects Fibre Channel interfaces and storage devices.

Fibre Channel

A method for connecting computers and peripheral devices and transferring data.

Generally used with servers requiring high-availability, to connect computers and storage systems.

Fibre Channel port

The connector for Fibre Channel interfaces.

When using ETERNUS storage, referred to as an FC-CA port, when using NetApp storage, referred to as an FC port, when using EMC CLARiiON, referred to as an SP port, when using EMC Symmetrix DMX or EMC Symmetrix VMAX, referred to as a DIRECTOR port.

fibre channel switch blade

A fibre channel switch mounted in the chassis of a blade server.

FlexVol

A function that uses aggregates to provide virtual volumes.

Volumes can be created in an instant.

FTRP

The pool for physical disks created by Automatic Storage Layering for ETERNUS.
In Resource Orchestrator, FTRPs are used as virtual storage resources on which Thin Provisioning attributes are configured.

FTV

The virtual volumes created by Automatic Storage Layering for ETERNUS.
In Resource Orchestrator, FTVs are used as disk resources on which Thin Provisioning attributes are configured.

global pool

A resource pool that contains resources that can be used by multiple tenants.
It is located in a different location from the tenants.
By configuring a global pool with the attributes of a tenant, it becomes possible for tenant administrators to use the pool.

GLS (Global Link Services)

Fujitsu network control software that enables high availability networks through the redundancy of network transmission channels.

GSPB (Giga-LAN SAS and PCI_Box Interface Board)

A board which mounts onboard I/O for two partitions and a PCIe (PCI Express) interface for a PCI box.

GUI (Graphical User Interface)

A user interface that displays pictures and icons (pictographic characters), enabling intuitive and easily understandable operation.

HA (High Availability)

The concept of using redundant resources to prevent suspension of system operations due to single problems.

hardware initiator

A controller which issues SCSI commands to request processes.
In iSCSI configurations, NICs fit into this category.

hardware maintenance mode

In the maintenance mode of PRIMEQUEST servers, a state other than Hot System Maintenance.

HBA (Host Bus Adapter)

An adapter for connecting servers and peripheral devices.
Mainly used to refer to the FC HBAs used for connecting storage devices using Fibre Channel technology.

HBA address rename setup service

The service that starts managed servers that use HBA address rename in the event of failure of the admin server.

HBAAR (HBA address rename)

I/O virtualization technology that enables changing of the actual WWN possessed by an HBA.

host affinity

A definition of the server HBA that is set for the CA port of the storage device and the accessible area of storage.
It is a function for association of the Logical Volume inside the storage which is shown to the host (HBA) that also functions as security internal to the storage device.

Hyper-V

Virtualization software from Microsoft Corporation.

Provides a virtualized infrastructure on PC servers, enabling flexible management of operations.

I/O virtualization option

An optional product that is necessary to provide I/O virtualization.
The WWNN address and MAC address provided is guaranteed by Fujitsu Limited to be unique.
Necessary when using HBA address rename.

IBP (Intelligent Blade Panel)

One of operation modes used for PRIMERGY switch blades.
This operation mode can be used for coordination with ServerView Virtual I/O Manager (VIOM), and relations between server blades and switch blades can be easily and safely configured.

ICT governance

A collection of principles and practices that encourage desirable behavior in the use of ICT (Information and Communication Technology) based on an evaluation of the impacts and risks posed in the adoption and application of ICT within an organization or community.

ILOM (Integrated Lights Out Manager)

The name of the Remote Management Controller for SPARC Enterprise T series servers.

image file

A system image or a cloning image. Also a collective term for them both.

infrastructure administrator

A user who manages the resources comprising a data center.

infra_admin is the role that corresponds to the users who manage resources.

Infrastructure administrators manage all of the resources comprising a resource pool (the global pool and local pools), provide tenant administrators with resources, and review applications by tenant users to use resources.

IPMI (Intelligent Platform Management Interface)

IPMI is a set of common interfaces for the hardware that is used to monitor the physical conditions of servers, such as temperature, power voltage, cooling fans, power supply, and chassis.

These functions provide information that enables system management, recovery, and asset management, which in turn leads to reduction of overall TCO.

IQN (iSCSI Qualified Name)

Unique names used for identifying iSCSI initiators and iSCSI targets.

iRMC (integrated Remote Management Controller)

The name of the Remote Management Controller for Fujitsu's PRIMERGY servers.

iSCSI

A standard for using the SCSI protocol over TCP/IP networks.

iSCSI boot

A configuration function that enables the starting and operation of servers via a network.

The OS and applications used to operate servers are stored on iSCSI storage, not the internal disks of servers.

iSCSI storage

Storage that uses an iSCSI connection.

LAG (Link Aggregation Group)

A single logical port created from multiple physical ports using link aggregation.

LAN switch blades

A LAN switch that is mounted in the chassis of a blade server.

LDAP (Lightweight Directory Access Protocol)

A protocol used for accessing Internet standard directories operated using TCP/IP.

LDAP provides functions such as direct searching and viewing of directory services using a web browser.

license

The rights to use specific functions.

Users can use specific functions by purchasing a license for the function and registering it on the manager.

link aggregation

Function used to multiplex multiple ports and use them as a single virtual port.

By using this function, it becomes possible to use a band equal to the total of the bands of all the ports.

Also, if one of the multiplexed ports fails its load can be divided among the other ports, and the overall redundancy of ports improved.

local pool

A resource pool that contains resources that can only be used by a specific tenant.

They are located in tenants.

logical volume

A logical disk that has been divided into multiple partitions.

L-Platform

A resource used for the consolidated operation and management of systems such as multiple-layer systems (Web/AP/DB) comprised of multiple L-Servers, storage, and network devices.

L-Platform template

A template that contains the specifications for servers, storage, network devices, and images that are configured for an L-Platform.

LSB (Logical System Board)

A system board that is allocated a logical number (LSB number) so that it can be recognized from the domain, during domain configuration.

L-Server

A resource defined using the logical specifications (number of CPUs, amount of memory, disk capacity, number of NICs, etc.) of the servers, and storage and network devices connected to those servers.
An abbreviation of Logical Server.

L-Server template

A template that defines the number of CPUs, memory capacity, disk capacity, and other specifications for resources to deploy to an L-Server.

LUN (Logical Unit Number)

A logical unit defined in the channel adapter of a storage unit.

MAC address (Media Access Control address)

A unique identifier that is assigned to Ethernet cards (hardware).

Also referred to as a physical address.

Transmission of data is performed based on this identifier. Described using a combination of the unique identifying numbers managed by/assigned to each maker by the IEEE, and the numbers that each maker assigns to their hardware.

maintenance mode

The state where operations on managed servers are stopped in order to perform maintenance work.
In this state, the backup and restoration of system images and the collection and deployment of cloning images can be performed.
However, when using Auto-Recovery it is necessary to change from this mode to active mode. When in maintenance mode it is not possible to switch over to a spare server if a server fails.

managed server

A collective term referring to a server that is managed as a component of a system.

management blade

A server management unit that has a dedicated CPU and LAN interface, and manages blade servers.
Used for gathering server blade data, failure notification, power control, etc.

Management Board

The PRIMEQUEST system management unit.
Used for gathering information such as failure notification, power control, etc. from chassis.

manager

The section (program) of Resource Orchestrator that operates on admin servers.
It manages and controls resources registered with Resource Orchestrator.

master slot

A slot that is recognized as a server when a server that occupies multiple slots is mounted.

member server

A collective term that refers to a server in a Windows network domain that is not a domain controller.

migration

The migration of a VM guest to a different VM host. The following two types of migration are available:

- Cold migration

  Migration of an inactive (powered-off) VM guest.

- Live migration

  Migration of an active (powered-on) VM guest.

multi-slot server

A server that occupies multiple slots.

NAS (Network Attached Storage)

A collective term for storage that is directly connected to a LAN.

network device

The unit used for registration of network devices.
L2 switches and firewalls fit into this category.

network map

A GUI function for graphically displaying the connection relationships of the servers and LAN switches that compose a network.

network view

A window that displays the connection relationships and status of the wiring of a network map.

NFS (Network File System)

A system that enables the sharing of files over a network in Linux environments.

NIC (Network Interface Card)

An interface used to connect a server to a network.

OS

The OS used by an operating server (a physical OS or VM guest).

overcommit

A function to virtually allocate more resources than the actual amount of resources (CPUs and memory) of a server.
This function is used to enable allocation of more disk resources than are mounted in the target server.

PDU (Power Distribution Unit)

A device for distributing power (such as a power strip).
Resource Orchestrator uses PDUs with current value display functions as Power monitoring devices.

physical LAN segment

A physical LAN that servers are connected to.
Servers are connected to multiple physical LAN segments that are divided based on their purpose (public LANs, backup LANs, etc.).
Physical LAN segments can be divided into multiple network segments using VLAN technology.

physical network adapter

An adapter, such as a LAN, to connect physical servers or VM hosts to a network.

physical OS

An OS that operates directly on a physical server without the use of server virtualization software.

physical server

The same as a "server". Used when it is necessary to distinguish actual servers from virtual servers.

pin-group

This is a group, set with the end host mode, that has at least one uplink port and at least one downlink port.

Pool Master

On Citrix XenServer, it indicates one VM host belonging to a Resource Pool.
It handles setting changes and information collection for the Resource Pool, and also performs operation of the Resource Pool.
For details, refer to the Citrix XenServer manual.

port backup

A function for LAN switches which is also referred to as backup port.

port VLAN

A VLAN in which the ports of a LAN switch are grouped, and each LAN group is treated as a separate LAN.

port zoning

The division of ports of fibre channel switches into zones, and setting of access restrictions between different zones.

power monitoring devices

Devices used by Resource Orchestrator to monitor the amount of power consumed.
PDUs and UPSs with current value display functions fit into this category.

power monitoring targets

Devices from which Resource Orchestrator can collect power consumption data.

pre-configuration

Performing environment configuration for Resource Orchestrator on another separate system.

primary server

The physical server that is switched from when performing server switchover.

primary site

The environment that is usually used by Resource Orchestrator.

private cloud

A private form of cloud computing that provides ICT services exclusively within a corporation or organization.

public LAN

A LAN used for operations by managed servers.
Public LANs are established separately from admin LANs.

rack

A case designed to accommodate equipment such as servers.

rack mount server

A server designed to be mounted in a rack.

RAID (Redundant Arrays of Inexpensive Disks)

Technology that realizes high-speed and highly-reliable storage systems using multiple hard disks.

RAID management tool

Software that monitors disk arrays mounted on PRIMERGY servers.
The RAID management tool differs depending on the model or the OS of PRIMERGY servers.

RDM (Raw Device Mapping)

A function of VMware. This function provides direct access from a VMware virtual machine to a LUN.

RDN (Relative Distinguished Name)

A name used to identify the lower entities of a higher entry.

Each RDN must be unique within the same entry.

Remote Management Controller

A unit used for managing servers.
Used for gathering server data, failure notification, power control, etc.

- For Fujitsu PRIMERGY servers

  iRMC2

- For SPARC Enterprise

  ILOM (T series servers)
  XSCF (M series servers)

- For HP servers

  iLO2 (integrated Lights-Out)

- For Dell/IBM servers

  BMC (Baseboard Management Controller)

Remote Server Management

A PRIMEQUEST feature for managing partitions.

Reserved SB

Indicates the new system board that will be embedded to replace a failed system board if the hardware of a system board embedded in a partition fails and it is necessary to disconnect the failed system board.

resource

General term referring to the logical definition of the hardware (such as servers, storage, and network devices) and software that comprise a system.

resource folder

An arbitrary group of resources.

resource pool

A unit for management of groups of similar resources, such as servers, storage, and network devices.

resource tree

A tree that displays the relationships between the hardware of a server and the OS operating on it using hierarchies.

role

A collection of operations that can be performed.

ROR console

The GUI that enables operation of all functions of Resource Orchestrator.

ruleset

A collection of script lists for performing configuration of network devices, configured as combinations of rules based on the network device, the purpose, and the application.

SAN (Storage Area Network)

A specialized network for connecting servers and storage.

SAN boot

A configuration function that enables the starting and operation of servers via a SAN.

The OS and applications used to operate servers are stored on SAN storage, not the internal disks of servers.

SAN storage

Storage that uses a Fibre Channel connection.

script list

Lists of scripts for the automation of operations such as status and log display, and definition configuration of network devices.
Used to execute multiple scripts in one operation. The scripts listed in a script list are executed in the order that they are listed.
As with individual scripts, they can are created by the infrastructure administrator, and can be customized to meet the needs of tenant administrators.
They are used to configure virtual networks for VLANs on physical networks, in cases where it is necessary to perform auto-configuration of multiple switches at the same time, or to configure the same rules for network devices in redundant configurations.
The script lists contain the scripts used to perform automatic configuration.
There are the following eight types of script lists:

- script lists for setup

- script lists for setup error recovery

- script lists for modification

- script lists for modification error recovery

- script lists for setup (physical server added)

- script lists for setup error recovery (physical server added)

- script lists for deletion (physical server deleted)

- script lists for deletion

server

A computer (operated with one operating system).

server blade

A server blade has the functions of a server integrated into one board.
They are mounted in blade servers.

server management unit

A unit used for managing servers.
A management blade is used for blade servers, and a Remote Management Controller is used for other servers.

server name

The name allocated to a server.

server NIC definition

A definition that describes the method of use for each server's NIC.
For the NICs on a server, it defines which physical LAN segment to connect to.

server virtualization software

Basic software which is operated on a server to enable use of virtual machines. Used to indicate the basic software that operates on a PC server.

ServerView Deployment Manager

Software used to collect and deploy server resources over a network.

ServerView Operations Manager

Software that monitors a server's (PRIMERGY) hardware state, and notifies of errors by way of the network.
ServerView Operations Manager was previously known as ServerView Console.

ServerView RAID

One of the RAID management tools for PRIMERGY.

ServerView Update Manager

This is software that performs jobs such as remote updates of BIOS, firmware, drivers, and hardware monitoring software on servers being managed by ServerView Operations Manager.

ServerView Update Manager Express

Insert the ServerView Suite DVD1 or ServerView Suite Update DVD into the server requiring updating and start it.

This is software that performs batch updates of BIOS, firmware, drivers, and hardware monitoring software.

Single Sign-On

A system among external software which can be used without login operations, after authentication is executed once.

slave slot

A slot that is not recognized as a server when a server that occupies multiple slots is mounted.

SMB (Server Message Block)

A protocol that enables the sharing of files and printers over a network.

SNMP (Simple Network Management Protocol)

A communications protocol to manage (monitor and control) the equipment that is attached to a network.

software initiator

An initiator processed by software using OS functions.

Solaris Container

Solaris server virtualization software.
On Solaris servers, it is possible to configure multiple virtual Solaris servers that are referred to as a Solaris zone.

Solaris zone

A software partition that virtually divides a Solaris OS space.

SPARC Enterprise Partition Model

A SPARC Enterprise model which has a partitioning function to enable multiple system configurations, separating a server into multiple areas with operating OS's and applications in each area.

spare server

A server which is used to replace a failed server when server switchover is performed.

storage blade

A blade-style storage device that can be mounted in the chassis of a blade server.

storage management software

Software for managing storage units.

storage resource

Collective term that refers to virtual storage resources and disk resources.

storage unit

Used to indicate the entire secondary storage as one product.

surrogate pair

A method for expressing one character as 32 bits.
In the UTF-16 character code, 0xD800 - 0xDBFF are referred to as "high surrogates", and 0xDC00 - 0xDFFF are referred to as "low surrogates". Surrogate pairs use "high surrogate" + "low surrogate".

switchover state

The state in which switchover has been performed on a managed server, but neither failback nor continuation have been performed.

System Board

A board which can mount up to 2 Xeon CPUs and 32 DIMMs.

system disk

The disk on which the programs (such as the OS) and files necessary for the basic functions of servers (including booting) are installed.

system image

A copy of the contents of a system disk made as a backup.
Different from a cloning image as changes are not made to the server-specific information contained on system disks.

tenant

A unit for the division and segregation of management and operation of resources based on organizations or operations.

tenant administrator

A user who manages the resources allocated to a tenant.

tenant_admin is the role for performing management of resources allocated to a tenant.

Tenant administrators manage the available space on resources in the local pools of tenants, and approve or reject applications by tenant users to use resources.

tenant folder

A resource folder that is created for each tenant, and is used to manage the resources allocated to a tenant.

L-Servers and local pools are located in tenant folders. Also, it is possible to configure a global pool that tenant administrators can use.

tenant user

A user who uses the resources of a tenant, or creates and manages L-Platforms, or a role with the same purpose.

Thick Provisioning

Allocation of the actual requested capacity when allocating storage resources.

Thin Provisioning

Allocating of only the capacity actually used when allocating storage resources.

tower server

A standalone server with a vertical chassis.

TPP (Thin Provisioning Pool)

One of resources defined using ETERNUS. Thin Provisioning Pools are the resource pools of physical disks created using Thin Provisioning.

TPV (Thin Provisioning Volume)

One of resources defined using ETERNUS. Thin Provisioning Volumes are physical disks created using the Thin Provisioning function.

UNC (Universal Naming Convention)

Notational system for Windows networks (Microsoft networks) that enables specification of shared resources (folders, files, shared printers, shared directories, etc.).

📥 Example

. . . .

\\hostname\dir_name

. . . .

UPS (Uninterruptible Power Supply)

A device containing rechargeable batteries that temporarily provides power to computers and peripheral devices in the event of power failures.

Resource Orchestrator uses UPSs with current value display functions as power monitoring devices.

URL (Uniform Resource Locator)

The notational method used for indicating the location of information on the Internet.

VIOM (ServerView Virtual-IO Manager)

The name of both the I/O virtualization technology used to change the MAC addresses of NICs and the software that performs the virtualization.
Changes to values of WWNs and MAC addresses can be performed by creating a logical definition of a server, called a server profile, and assigning it to a server.

Virtual Edition

The edition that can use the server switchover function.

Virtual I/O

Technology that virtualizes the relationship of servers and I/O devices (mainly storage and network) thereby simplifying the allocation of and modifications to I/O resources to servers, and server maintenance.
For Resource Orchestrator it is used to indicate HBA address rename and ServerView Virtual-IO Manager (VIOM).

virtual server

A virtual server that is operated on a VM host using a virtual machine.

virtual storage resource

This refers to a resource that can dynamically create a disk resource.
An example being RAID groups or logical storage that is managed by server virtualization software (such as VMware datastores).
In Resource Orchestrator, disk resources can be dynamically created from ETERNUS RAID groups, NetApp aggregates, and logical storage managed by server virtualization software.

virtual switch

A function provided by server virtualization software to manage networks of VM guests as virtual LAN switches.
The relationships between the virtual NICs of VM guests and the NICs of the physical servers used to operate VM hosts can be managed using operations similar to those of the wiring of normal LAN switches.

A function provided by server virtualization software in order to manage L-Server (VM) networks as virtual LAN switches.
Management of relationships between virtual L-Server NICs, and physical server NICs operating on VM hosts, can be performed using an operation similar to the connection of a normal LAN switch.

VLAN (Virtual LAN)

A splitting function, which enables the creation of virtual LANs (seen as differing logically by software) by grouping ports on a LAN switch.
Using a Virtual LAN, network configuration can be performed freely without the need for modification of the physical network configuration.

VLAN ID

A number (between 1 and 4,095) used to identify VLANs.
Null values are reserved for priority tagged frames, and 4,096 (FFF in hexadecimal) is reserved for mounting.

VM (Virtual Machine)

A virtual computer that operates on a VM host.

VM guest

A virtual server that operates on a VM host, or an OS that is operated on a virtual machine.

VM Home Position

The VM host that is home to VM guests.

VM host

A server on which server virtualization software is operated, or the server virtualization software itself.

VM maintenance mode

One of the settings of server virtualization software, that enables maintenance of VM hosts.
For example, when using high availability functions (such as VMware HA) of server virtualization software, by setting VM maintenance mode it is possible to prevent the moving of VM guests on VM hosts undergoing maintenance.
For details, refer to the manuals of the server virtualization software being used.

VM management software

Software for managing multiple VM hosts and the VM guests that operate on them.
Provides value adding functions such as movement between the servers of VM guests (migration).

VMware

Virtualization software from VMware Inc.
Provides a virtualized infrastructure on PC servers, enabling flexible management of operations.

VMware DPM (VMware Distributed Power Management)

A function of VMware. This function is used to reduce power consumption by automating power management of servers in VMware DRS clusters.

VMware DRS (VMware Distributed Resource Scheduler)

A function of VMware. This function is used to monitor the load conditions on an entire virtual environment and optimize the load dynamically.

VMware Teaming

A function of VMware. By using VMware Teaming it is possible to perform redundancy by connecting a single virtual switch to multiple physical network adapters.

Web browser

A software application that is used to view Web pages.

WWN (World Wide Name)

A 64-bit address allocated to an HBA.
Refers to a WWNN or a WWPN.

WWNN (World Wide Node Name)

A name that is set as a common value for the Fibre Channel ports of a node. However, the definitions of nodes vary between manufacturers, and may also indicate devices or adapters. Also referred to as a node WWN.

WWPN (World Wide Port Name)

A name that is a unique value and is set for each Fibre Channel port (HBA, CA, fibre channel switch ports, etc.), and is the IEEE global MAC address.

As the Fibre Channel ports of the same WWPN are unique, they are used as identifiers during Fibre Channel port login. Also referred to as a port WWN.

WWPN zoning

The division of ports into zones based on their WWPN, and setting of access restrictions between different zones.

Xen

A type of server virtualization software.

XSB (eXtended System Board)

Unit for domain creation and display, composed of physical components.

XSCF (eXtended System Control Facility)

The name of the Remote Management Controller for SPARC Enterprise M series servers.

zoning

A function that provides security for Fibre Channels by grouping the Fibre Channel ports of a Fibre Channel switch into zones, and only allowing access to ports inside the same zone.